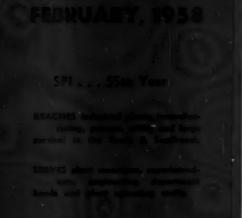
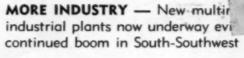
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The Industrial and Power Journal of the South

west





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# ALL IN A DAY'S WORK at Vittsburgh Oliging



CHROME-MOLY PIPING for high pressure high temperature central station

ALUMINUM HEADER for process piping

These three jobs are typical of the wide variety of custom piping work which we do for the power and process industries. In the background of the photo welders are shown making the heli-arc root pass on 18" O.D., 3.875" wall, chrome-moly main steam piping. In the foreground, ready for final inspection, is a 12" header for a process operation, fabricated of 36" aluminum alloy. The pressure vessel, of austenitic steel, is one of many we produce for atomic energy application.

The manufacturing of this type of piping requires specialized facilities . . . for engineering, fabricating, testing, assembly, and erection.

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Volume 76

Number 2



One of several Clorage Type XI. Fans used in this application. Fan equipped with stainless steel wheel and V-belt driven from a hydraulic coupling.

# Clarage Fans have what it takes

for this tough exhaust assignment in the production of titanium dioxide

Exhausting 800° F gases from rotary calciners through scrubber units and electrical precipitators to the atmosphere.

That's the demanding task this large chemical manufacturer gave Clarage Type XL Fans.

What kind of a job evaluation does Clarage receive? Several repeat orders furnish the answer. In fact, three additional Clarage Fans will soon be installed in a major expansion at this plant.

You, too, will find it pays dividends to choose the fan name of quality — Clarage. Call us in for capable assistance on your next requirements in the air handling and conditioning field. It's characteristic of Clarage equipment to prove out successfully no matter how exacting the application. CLARAGE FAN COMPANY, Kalamazoo, Michigan.



.. dependable equipment for making air your servant

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES . IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreel



This new 70,000 kw reheat turbine—like all other turbines in this plant—is 100% Texaco-lubricated to keep it free from rust, sludge and foam.

## A large Eastern Utility found:

# Texaco gives these 3 big benefits for <u>complete</u> turbine protection:

- 1. Unquestionable dependability. Texaco Regal Oil R&O keeps the utility's turbine system clean; prevents rust, sludge and foam from forming; keeps bearing temperature normal and governor response instantaneous. Texaco dependability is a *fact* for this utility, based on long experience.
- 2. High efficiency. Texaco Regal Oil R&O assures smooth performance and freedom from unscheduled outages. Texaco Regal Oil R&O gives bearings full protection throughout an extra-long oil service life.
- 3. Technical service. Texaco offers this important benefit at a time when power demands are almost out-growing turbine production. Past experience in the power plants has proved Texaco Lubrication Engineering Service to be quick and reliable. This service is always available to Texaco customers—whatever the need.

There is a complete line of Texaco Regal Oils R&O to meet the requirements of all leading turbine manufacturers, regardless of turbine type or size. Let a Texaco lubrication expert help you select the Texaco Regal Oil R&O that will keep turbine efficiency high and maintenance costs at a minimum. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States—or write:

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# Southern Founds & Including Southwest

Eugene W. O'Brien Managing Director Vol. 76 No. 2

## FEBRUARY, 1958

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# Facts and Trends

February 3, 1958

◆ FLY-ASH PROBLEM — Three years ago, the International Harvester Plant at Memphis, Tennessee made a decision to eliminate fly-ash discharge from its boiler stacks. It spent a considerable sum of money in accomplishing this purpose. But, in addition to improving public relations, the Memphis Works also decreased plant maintenance costs.

\*Clean Stacks Make Good Neighbors\* — featured in this issue — highlights the air pollution problem, investigation, equipment selected, and performance data.

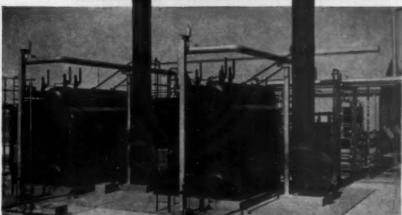
- ◆ ULTRA-STRENGTH STEELS New 16-page booklet details the grades available in the country today. These steels, with yield strengths over 200,000 psi, are meeting increasing requirements for higher strengths and higher strength-weight ratios. For free copy of ULTRA-STRENGTH STEELS, write Climax Molybdenum Company, 500 Fifth Ave., New York 36, N. Y.
- ◆ EXPLOSION HAZARDS Check list of 13 questions that can help you determine whether uncontrolled flammable gases, vapors, dusts, liquids and other combustible materials are making your plant unsafe. Answers are contained in a new 8-page folder HAZARD FINDER, available at no charge from Crouse Hinds Company, Wolf & Seventh North Sts., Syracuse, N. Y.
- ◆ DUST CONTROL An unusual dust collector, designed for and successfully used in the lightweight aggregate industry for the past five years, is finding increased application in other Southern process industries.

One of the original installations was designed for collecting aggregate dusts at the Bremo Bluff, Virginia plant of the Southern Lightweight Aggregate Corp. Effluent from the kilns of this plant was approximately 50,000 cfm at a temperature of around 400 F.

The collector has operated 4 years without repairs. Nearly 70 tons of dusts are collected every 24 hours. For details, check "Dust Control" in this issue.

◆ INDUSTRIAL DERMATITIS — State compensation boards report that two-thirds of all occupational diseases are skin diseases. Information showing how many of them can be prevented is fea— (Continued on Page 6)

# Voqt



# STEAM BOILERS give versatility with economy

Above: Two units serve a gas pipeline company.

Left: Installation in fibre boxboard plant.

Right: Unit for a leading soap manufacturer.



Available in capacities from 10,000 to 50,000 pounds steam per hour in three standard pressures of 175, 250 and 375 pounds per square inch gage, factory assembled.

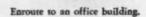
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# Facts and Trends (Continued)

tured in "The Prevention of Occupational Skin Diseases" available free from Hungtington Laboratories, Huntington, Indiana.

- ♠ METAL GRATING If you specify, buy, or use metal grating and treads, a new technical guide, prepared with the cooperation of eight leading manufacturers, features tables, standards, specifications and glossary of terms used in the industry. "Metal Grating Handbook" is available at \$1 per copy from Metal Grating Institute, Inc., One Gateway Center, Pittsburgh 22, Pa.
- INDUSTRIAL EXPANSION plans during the next decade must and will give prime consideration to Southern States, according to William W. Wright, Budget Director of the Johns-Manville Corporation. He recently pointed out that Johns-Manville has built new plants in Virginia, Georgia, Mississippi and Texas since the depression but none in the Middle Atlantic or Middle Western states, and only one in the Northeast.

This trend towards giving special consideration to the growth areas prevails throughout industry and is based on economic progress as well as the development of new and improved sources of industrial power.

- ♦ NO GLOOM HERE Management of the Gulf Oil Corporation does not believe that the exile of one Russian dog into outer space, which presumably is colder and even less habitable than Siberia, is the beginning of the end of the world. Gulf's management recently approved plans that call for an expenditure of \$564 billion during 1958 (highest in the company's history) to expand and improve the facilities of the Corporation and its subsidiaries.
- ◆ EQUIPMENT LEASING Operating plants with leased equipment will become increasingly important in industries whose ratio of fixed assets to tangible net worth is greater than 30%. It frees working capital for expansion of sales, expanding research, etc.

A manufacturer does not have to freeze his own capital in equipment and he does not have to worry about equipment becoming obsolete. At the end of a short term lease a company can always secure the newest piece of equipment on another lease. Typical lease is from 3 to 5 years.

◆ INDUSTRIAL EXPANSION BRIEFS — \$17 million NUCLEAR-FIRED PLANT to be built by Carolinas Virginia Nuclear Power Associates at Parr Shoals, S. C. has a mid-1962 operating target . . . PITTSBURGH PLATE GLASS COMPANY'S 250,000 sq ft continuous fiber glass yarn plant to be built at Shelby, N. C. will employ approximately 850 . . . 1959 operation scheduled for KENNECOTT COPPER CORPORATION'S \$20 million copper refinery near Baltimore, Md.

Multimillion dollar gypsum board, lath and plaster plant planned by BESTWALL GYPSUM COMPANY for Savannah, Georgia . . . NATIONAL PETROCHEMICALS have selected a site on the Houston Ship Channel for their new 75 million pound-per-year polyethylene plant . . . \$21 million power generating expansion program during next three years has been announced by SOUTHWESTERN GAS AND ELECTRIC COMPANY . . . (See pages 8-12 for details and other plant expansion notices.)



# Here's why corrosion costs you more than Wrought Iron

One of the most convincing demonstrations of the economy of using durable material is a pipe repair job where low-first-cost material has failed—and is being replaced.

The original installation had been quickly made by plumbers. But the replacement calls for hours of work by as many as five crafts: plumber, mason, plasterer, carpenter, painter. Often, maintenance is billed at overtime rates. And this is only part of the cost story. Production slow-down, disrupted routine may amount to far more than the maintenance charges.

Fortunately there's an answer to pipe durability in corrosive

services—Byers Wrought Iron pipe. In literally thousands of applications where corrosion is a threat, the use of this material has proved the soundest kind of economy move.

The next time you specify or approve pipe, you'll find it profitable to investigate the durability records of wrought iron.

Our bulletin, "The ABC's of Wrought Iron," gives the what, why and where of this material. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, New York.

Remember—
the pipe that lasts
the longest
costs the least!

FOR PRODUCTION
CONTINUITY
LOWER MAINTENANCE—
Insist on Byers
WROUGHT IRON PIPE





# NEWS for the South & Southwest

# \$17 MILLION NUCLEAR-FIRED PLANT AT PARR SHOALS, S. C.

## Four Stage Development Program Has Mid-1962 Operating Target

Parr Shoals, S. C. has been designated the site for the nuclear-fired power generating plant of Carolinas Virginia Nuclear Power Associates. Inc. Plant location will be approximately 25 miles northwest of Columbia, S. C. on the Broad River at Parr Shoals, where South Carolina Electric & Gas Company has a hydro-electric power station.

The nuclear installation will include a dome-like vapor container housing the reactor, a steam superheater and preheater, control area, office area, service building, storage basin for used nuclear fuels, new fuel storage facilities, waste disposal building and ion exchange area.

Development program consists of four stages:

(1) Research and development of the pressure tube, heavy water moderated and cooled nuclear reactor plant; (2) Construction of a prototype plant having a gross electrical capacity of 19,000 kw to verify the research and development program and furnish data for the evaluation of a future plant of 200,000 kw capacity or larger;

(3) Operation of the prototype plant with various core and component designs:

(4) Possible construction in the future of a commercial nuclear power plant of 200,000 kw or larger.

Westinghouse will develop the reactor. Stone & Webster will act as a consulting, design and construction supervision agent, and General Nuclear Engineering Corporation will provide consulting services required in connection with nuclear science and engineering problems.

(More details - pages 68-70)

# Pittsburgh Plate Glass Building Huge Carolina Glass Yarn Plant

A multimillion dollar 350,000 sq ft continuous fiber glass yarn plant to be built at Shelby, North Carolina by the Pittsburgh Plate Glass Company will employ approximately 850 at capacity operation. The one-story structure will be completely air conditioned to insure both maximum production quality and desirable working conditions.

Daniel Construction Company of Greenville, South Carolina is the general contractor, according to Robert A. McLaughlin, general manager of the company's fiber glass division.

All known types of continuous yarns now being manufactured by the fiber glass industry will be produced in the North Carolina plant. These yarns are used in producing both decorative and industrial fabrics and for reinforcing paper and plastic products.

The new unit will have 16 glass furnaces capable of producing 25,-000,000 pounds of yarn a year. It will employ the direct melt system of making continuous yarn and yarn will be twisted and plied on ring twisters specifically engineered for this plant.

Two furnaces will be completed and ready for production when the structure is completed. Installation of the other 14 furnaces will require an additional 18 months. The glassmaking area of the new plant will operate three shifts each day through a seven day week.

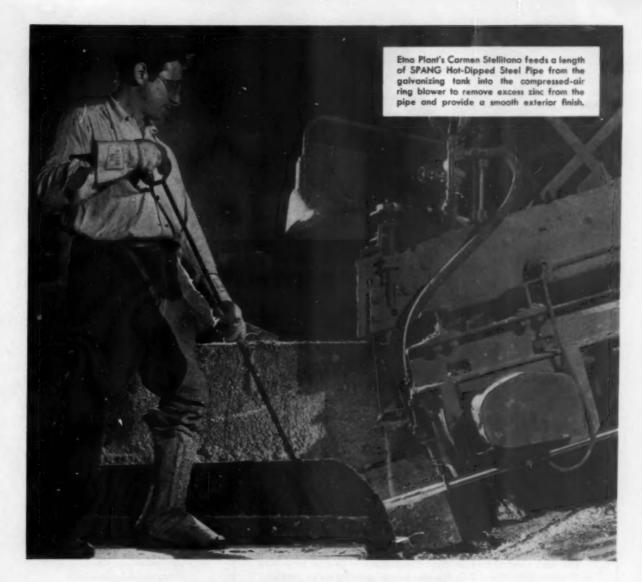
The Shelby plant will require approximately 3½ million cu ft of gas a day when at capacity production.

#### \$20 Million Copper Refinery Announced for Baltimore Area

Kennecott Copper Corporation has purchased from the Baltimore & Ohio Railroad about 200 acres in Anne Arundel County near Baltimore and will build a new \$20 million electrolytic copper refinery. Operation is scheduled for 1959. About 450 will be employed.

#### Multimillion Gypsum Plant for Savannah

With a completion date set for late 1959, construction will soon be started on Bestwall Gypsum Company's new multimillion dollar gypsum board, lath and plaster plant 3 miles west of Savannah, Georgia. Bestwall is now the third largest gypsum company in the United



# Out of this galvanizing tank comes the best steel pipe you can buy!

...\*Spang, of course!

#### AND HERE'S WHY ...

UNIFORM STRENGTH—SPANG Steel Pipe is produced under close control during forming and welding to provide a uniform pipe that's easy to cut, bend and thread . . . and it's hydrostatically tested well above normal operation pressures to be sure you get a strong pipe for rugged use.

HEAVY-DUTY UNIFORM FINISH—
of prime western zinc, air-wiped outside to produce a smooth, even finish
that will stand up under severe bending strains . . . blown inside with

superheated steam to provide a smooth finish for easy flow of liquids.

HIGH CORROSION RESISTANCE— Quick quenching of the hot galvanized pipe in a sodium dichromate solution gives a strong bonding of the finish to the steel . . . helps retard formation of white rust . . . adds

## SPANG-CHALFANT

extra service life to the pipe.

THE NATIONAL SUPPLY COMPANY General Sales Offices: Two Gateway Center, Pittsburgh, Pa. SPANE

District Sales Offices Atlante, Baston, Detroit, Houston, Los Angeles, New York, Philodelphia, Pittsburgh, St. Louis NEXT JOB MAKE IT STEEL PIPE!

W's ideal for any piping installation, especially drainage and vent lines. You'll get quality every time. Save money in the long run, tool There's a SPANG Distributor near you, ready to give you quality service on your order.

States, operating seven plants in this country and one in Canada.

The new plant will employ approximately 250 and will have an annual production capacity in excess of 250 million sq ft of gypsum board and lath.

Bestwall Gypsum's plant will be located on a 25 acre site near the Savannah & Atlanta Railway, a subsidiary of the Central of Georgia Railway Company.

#### Wyandotte Expands La. Facilities

Wyandotte Chemicals Corporation is well underway on the second major phase of its expansion into the South. A new \$20 million chemical plant (300 tons per day of chlorine and 330 tons per day of caustic soda) is under construction adjacent to the company's 60,000,000 lb ethylene-oxide plant at Geismar, Louisiana. The site is on the east bank of the Mississippi about 25 miles south of Baton Rouge. New plant is scheduled to go on stream the last quarter of '58.

# New 75 Million Pound-Per-Year Polyethylene Plant — Houston

Houston, Texas has been chosen by National Petro-Chemicals Corporation as the site for its second polyethylene plant, according to Dr. Robert E. Hulse, Vice President.

The new 75 million pound-peryear plant will be located on a 200acre site on the Houston Ship Channel, in an area which has been set aside for industrial development by Phillips Petroleum Company, not far from the San Jacinto monument. High-purity ethylene will be supplied by Phillips under longterm contract from its new ethylene plant at Sweeny, Texas, whence it will be piped about 70 miles to the Phillips Chemical Company Adams Terminal plant for final purification before delivery to National Petro-Chemicals' polyethylene plant. Phillips will also supply the natural gas requirements of the plant.

Phillips has extensive storage facilities for ethylene in a salt dome at the Clemens Terminal, which is located on the Sweeny-Houston pipeline, from which it will be possible to supply National Petro-Chemicals' plant with ethylene during turnarounds at the Sweeny plant.

The new polyethylene plant is scheduled for operation for late 1958. Byron J. Anderson will be plant manager. M. W. Kellogg is handling the engineering and construction of the plant.

The new plant will produce 75 million pounds-per-year of intermediate-density polyethylene resins by a modification of the conventional high-pressure process which is already in operation at the company's Tuscola, Illinois plant. The intermediate - density resins will have properties somewhere between those of the original "squeeze bottle" polyethylenes and the new high-density resins produced by the so-called "low-pressure" processes.

The polyethylene production at the new plant will be sold under the trade-mark "Petrothene" by U. S. Industrial Chemicals Co., Division of National Distillers and Chemical Corporation. National Petro-Chemicals Corporation, which is building the new plant, is a subsidiary of National Distillers and Panhandle Eastern Pipeline Company

## Florida Nuclear Plant Proposal . . .

The East Central-Florida West Coast Nuclear Groups have filed a proposal with the A.E.C. for the design, development, construction and operation of a high temperature, gas-cooled, heavy water-moderated, pressure tube reactor of 50,000 kw capacity. Plant would be built on the system of the Florida West Coast group and would be a prototype for a later 200,000 kw plant.

Proposal states that it is expected the General Nuclear Engineering Corporation of Dunedin, Florida will be the design agent and nuclear project engineer. American Gas and Electric Service Corporation would be the principal design and construction engineer.

## \$21 Million for Ark-La-Tex Area . . .

A \$21,000,000 electric power generating expansion program during the next three years has been announced by Southwestern Gas and Electric Company, with headquarters in Shreveport.

Program involves the addition of 100,000 kw units at both of the company's plants in Northwest Louisiana. One unit is scheduled to be put on the line in 1959 and the other in 1960. Present capacity of the two Louisiana plants is 216,000 kw. Other plants in Texas and Arkansas bring present capacity to a total of 482,500 kw.

## \$20 Million Brewery for Tampa, Florida

General contractors for the new \$20 million Anheuser-Busch Budweiser plant, scheduled for Tampa, Florida are Mills and Jones of St. Petersburg. Associated with them will be Dickman. Pickens and Bond of Little Rock, Ark. J. K. Hyatt, vice president in charge of engineering for Anheuser-Busch, will have general supervision of the construction for the company. Completion of the company's fourth brewery is scheduled for late 1958.

More Plants-Next Page



#### BRAXON AND FLAKO

Liquid and dry boiler feedwater treatments that prevent and remove scale in many types of water. Stop foaming and carry-over.

#### COOLEX

Prevents scale and corrosion in condenser cooling water systems, air washers, chilled and hotwater circulating systems.

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Prevents scale and corrosion in humidifying systems.

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The Anderson Service Representative in your area will be glad to study your particular water problems and make recommendations. He will have water samples analyzed in our laboratories shortly after beginning treatment and make any adjustments in the treatment that may be necessary. Similar analyses will continue at regular intervals. There is no charge for this valuable service.

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# News of the South-Southwest — more power . . . more plants . . . more money

#### Petrochemicals - W. Va.

#### \$8 Million Extraction Plant Is Base for New Development

With grading and foundations virtually completed, United Fuel Gas Company's \$8 million Kenova Extraction Plant will soon get underway. The plant, adjacent to the company's Kenova Compressor Station, on the Big Sandy River about 12 miles from Huntington, West Virginia, will extract valuable pettrochemical raw materials from natural gas. Production is scheduled for late 1958.

J. F. Pritchard & Company of Kansas City holds the construction contract. Plant will include an absorber column 102 ft high and a lean oil stripper 134 ft high. A 40 x 70 ft utility building will house offices and other facilities. A 36 x 60 ft compressor building will house a 6,700 hp gas turbine which will drive a centrifugal compressor.

Plant is designed to recover heavier hydrocarbons from 170 million cu ft of natural gas per day. Plant will produce a mixed stream of liquid hydrocarbons containing quantities of ethane, propane, butane and natural gasoline.

Extraction plant is part of a \$13



#### Union Bag-Camp's Florida Plant

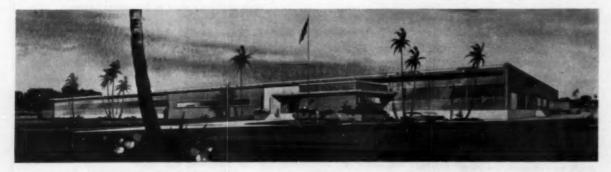
This new plant of the Union Bag-Camp Paper Corporation near Lakeland, Florida is an Armco S-3 steel building supplied by Armco Drainage & Metal Products, Inc. It consists of five 60 ft wide units joined at the sidewalls. Working area is 60,000 sq ft.

The multiple rigid-frame type of construction was selected for an unobstructed area in which to hang the considerable number of plumbing and electrical conduits. Building has 100 Steelox translucent skylights that permit daytime operations with a minimum of artifical lighting.

million project by which Columbia Gas System companies expect to make greater economic use of the rich natural gas streams the system operates. Columbia will build a hydrocarbon fractionation plant and storage facilities at Siloam, Kentucky and a pipeline to connect the two plants.

## Stephens-Adamson's Mississippi Plant Now in Production

New plant facilities consisting of 40,000 sq ft of manufacturing area, (Continued on Page 106)



# Globe-Union Building Tampa Battery Plant

Completion of Globe-Union's 70,000 sq ft storage battery manufacturing plant is scheduled for late spring of '58. \$1 million plant is located on a 17 acre site in Tampa's new Industrial Park area north of the city and is near the new Schlitz Brewery plant.

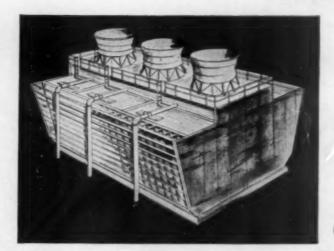
While the company also produces spark plugs and

roller skates, the new Florida operation will manufacture storage batteries exclusively. Harris and Frye of Jacksonville are architects and the Henry C. Beck Company of Atlanta and Dallas are general contractors.

In addition to the latest industrial plant innovations and equipment designed for materials handling and production, unique construction features especially adapted to the Florida climate will be incorporated in the building. Porcelainized steel jalousies across the front of the building and a continuing series of overhead doors on the rear will make it possible to open both the front and the rear of the building.



A new stant on Industrial Cooling Towers



MARLEY
Class
600
Double-Flow

NEW IN PROFILE -- NEW IN PERFORMANCE. These characteristic advances announce a forward trend in cooling towers and introduce the new Marley Class 600 Double-Flow and Single-Flow models. They embody design improvements that are seven-league strides in water cooling practice and achievement. . . The new profile is completely functional. It is the basis of many fundamental changes that mean increased cooling capacity in every frame size with greater power economy and no additional basin cost. Class 600 Cross-Flows have more filling and the ability to keep more water in the fill area; to reduce direct, unbroken water fall. The fill is of uniform width at all elevations, exposing the water to equalized air flow at all points of the cooling chamber. • • • From the new wide louvered walls to the fan, air flow is cleared of obstructing elements. Pressure control and air discharge are more proficient. This lowered draft loss efficiently balances increased water capacity in Class 600 Cross-Flows. ● ● The angled louver walls make possible simple controls that facilitate winter operation in areas where icing is a problem. ♦ • • In Class 600 Cross-Flows extended durability-increased

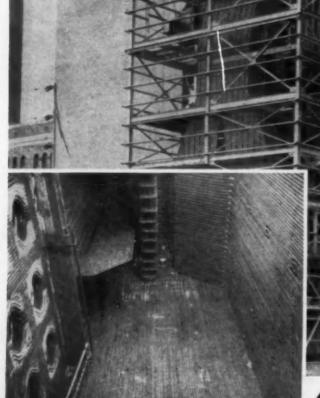
resistance to corrosion—keeps pace with stepped-up cooling ability. They are the first standard models completely asbestos cement board encased, and they introduce inert materials for use throughout the structure. • • • These towers establish a quality standard new to water cooling equipment and of importance to you as an investor. You can get all detailed information from the nearest Marley engineer in 56 major cities or by writing direct.

The Marley Company

Kansas City, Missor ri

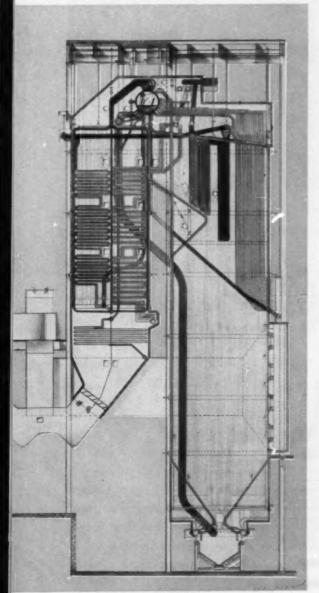


This is R. S. Wallace Station showing modern enclosure for Unit No. 6, a 600,000 lbs./hr. Riley Boiler. Below, Unit No. 7 under construction.



Inside furnace of Unit #7 at E. Peeria. At left — 5 of 16 Riley Flare Type Burners; burner openings are water-cooled. Top left — one of two bare tube platens that are employed to evenly distribute furnace heat across superheater and reheater.

# Sixth RILEY Boiler at R. S. Wallace Station



Capacity — 630,000 lbs/br.

Drum pressure — 1650 psig
Superheat, Reheat — 1000 F
Fuel: Central Illinois Coal
Average Overall Efficiency — 87.7%

COMMONWEALTH ASSOCIATES, INC.

CONSULTING ENGINEERS

CENTRAL ILLINOIS LIGHT COMPANY has also ordered its EIGHTH Riley Boiler for its Lamarsh Station

Since 1939, Central Illinois Light Company has installed six Riley Boilers in its East Peoria R. S. Wallace Station. The latest, a 690,000 lb/hr Reheat Unit is illustrated here and will shortly go on the line. The recent order of an 850,000 lb/hr Reheat Unit for Lamarsh Station will bring the total of steam generated by Riley boilers to 3,415,000 lbs/hr. Dependable operation, and high availability are the operating characteristics of these Riley boilers.

A survey of your plant by a consulting engineer could show ways of making surprising savings in your power costs.



Stoker Corporation

Sales Offices: Worcester, New York, Philadelphia, Buffalo, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlol te, New Orleans, Atlanta, St. Lauis, Kansas City, St. Paul, Houston, Salt Lake City, Los Angeles, San Francisco, Partland, Seattle.

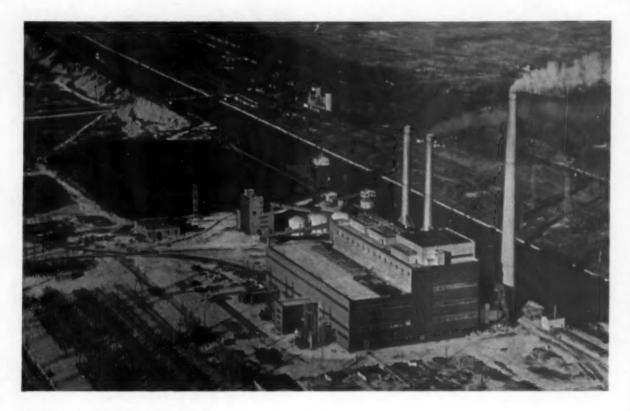
# POWELL

world's largest family of valves



FOR EVERY FLOW CONTROL PROBLEM Powell offers more kinds or types of valves, available in the largest variety of metals and alloys, to handle every flow control requirement. Your local valve distributor will be glad to tell you all about them. Or write to us for the full facts.

THE WM. POWELL COMPANY . Dependable Valves Since 1846 . Cincinnati 22, Ohio



# Setting new records with world's largest generating unit

As one step in an expansion program totalling two million kw, Chicago's Commonwealth Edison Co. in 1957 placed in operation the largest turbine generator in the world at their Will County Station. This 275,000 kw unit burns 125 tons of coal an hour and uses 204,000 gallons of circulating water every minute.

The project was designed by Stone & Webster Engineering Corporation and constructed by Commonwealth Edison. The close cooperation between designer and builder permitted this unit to be installed in the unusually short period of 28 months.

As a completely integrated organization, Stone & Webster Engineering Corporation is experienced and equipped to handle a single engineering phase or to take full responsibility for the completion of your entire project.



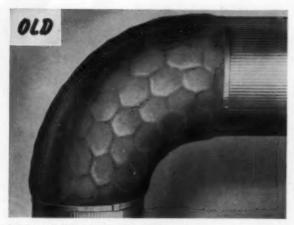
New Cross-Compound Unit has LP turbines with 43-in, last stage blades,

Write or call us for information as to how our experience may be of assistance to you.

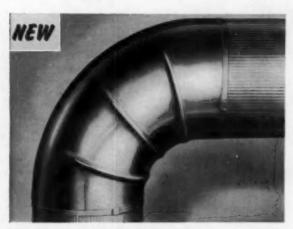


STONE & WEBSTER ENGINEERING CORPORATION
A SUBSIDIARY OF STONE & WEBSTER, INC.

New York Boston Chicago Pittsburgh Houston San Francisco Los Angeles Seattle Toronto



UGLY, COSTLY CHICKEN WIRE AND MASTIC albow coverings like this are now obsolete. New Childers Aluminum Ell-Jacs end the need for slow, costly hand-made "patches". Childers Ell-Jacs keep their new look, never need expensive periodic painting or maintenance.



NEW CHILDERS ALUMINUM ELL-JACS now make possible neat, weather-light aluminum protection from one end to the other of your insulated lines. Childers Ell-Jacs are precision formed for long-radius 90° and 45° ells and have factory-applied moisture barrier.

# **Childers Announces New Aluminum Elbow Jacketing** For Insulated Lines

Revolutionary new Childers Ell-Jacs go on fast and easy . . . fit perfectly . . . cut installation costs . . . never need painting . . . and, used with Childers Jacketing, give your insulated lines that well-dressed look from end to end.

Childers Ell-Jacs, together with Childers Jacketing, enable you to install maintenance-free aluminum over every square foot of your valuable insulation. You protect all of your insulation investment at lowest cost. You get the bonus of a better looking plant and easier housekeeping. Aluminum keeps its new look, needs no expensive periodic painting.

Leading power plant engineers report that insulation on steam lines lasts far longer when protected with Childers Aluminum Jacketing. Childers Jacketing protects the insulation indefinitely against damage from workmen, equipment, and dripping fluids like oil and grease.

You can reduce heat loss by radiation, too, when you use Childers Jacketing on power plant lines and in-sulated equipment. This means increased efficiency and lower fuel costs.

Positive weather-proofing, too, is assured by exclusive Childers Lap-Seal (Patents Pending). Factory-attached moisture barrier prevents harm to the underneath side of the aluminum.

You also get greater strength and greater protection because Childers Jacketing is cross-crimped.

First cost is less for Childers Jacketing than for any other permanent type weatherproofing-even less than some temporary coverings.

It's easy to install Childers Jacketing. All you need are pliers and screwdriver, plus inexpensive strapping. Two men can do the job. Jacketing can be removed to inspect lines, then reapplied without waste.

Childers Engineering Representatives in 27 cities provide technical information and assistance on the protection of insulated lines, elbows, towers, vessels and tanks. Only Childers has this nationwide service organ-

For a free sample of Childers Aluminum Weather-proof Jacketing, with engineering data on how to safeguard your insulation, write to Childers Manufacturing Company, Dept. SPI-11, P.O. Box 7467, Houston 8, Texas.

See our ad in Sweet's Industrial Construction File, Chemical Engineering Catalog and Refinery Catalog.



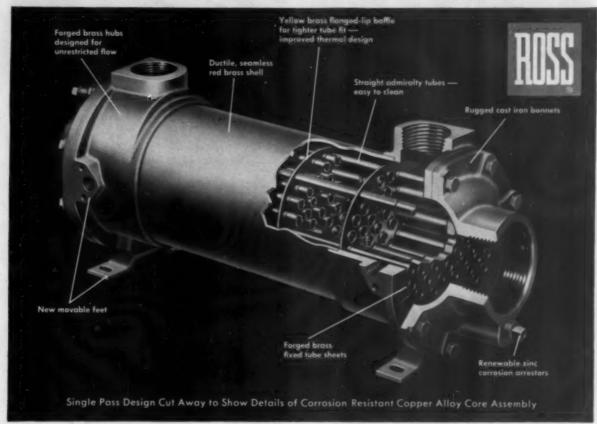
EXCLUSIVE LAP-SEAL, available at no extra cost, is a series of 8 ribs rolled into the underlapping edge of the jacketing, providing automatic measure of the 2" circumferential lap. Proper lap is assured without waste. Labor is saved. Where desired, a positive weather seal is easily made with Lap-Seal and a mustic.



CHILDERS HEAVY WEIGHT aluminum jacketing is recommended for extra protection of lines along walkways and other areas subject to physical abuse. Also recommended for protection of insulated towers, vessels and tanks. Comes in labor-saving 4' wide rolls.

## LOOK AT THE LEADER'S LATEST ...

# '58 design of a famous line . . . Ross BCF Exchangers



LOOK AT THE LIST ... new design features, new sizes, new capacities, new mountings, new materials ... new low prices! In 1958 the leader and originator of small, compact, fully standardized exchangers takes another step forward.

The Ross Heat Exchanger Division of American-Standard originated the whole BCF idea 14 years ago. Before then, pre-engineered design, mass produced parts and stocked assemblies were untried for a unit of this type. Designers and users of original equipment were quick to adopt the BCF as standard. Today, on a larger scale than ever, it is cooling lube oil, jacket water, hydraulic and other fluids for a wide variety of industries.

But, even with such success, the BCF has never been permitted to stand still. Ross has persisted in making constant design refinements and performance improvements . . . 1958 is typical: New baffles with flanged lip at each tube hole and around outer edge for tighter fit and improved thermal characteristics. New stamped steel feet, movable in three positions around hubs for easy, more adaptable mounting. New sizes and capacities . . . 46 models . . . one, two or four pass designs . . . giving greater selection than ever before.

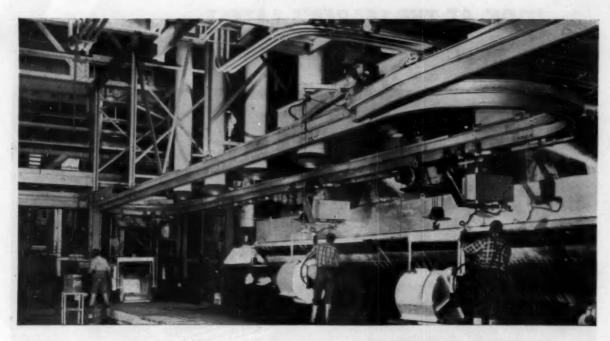


Look at the leader's latest.
Send in the coupon below
for the new Ross Bulletin
... an up-to-date run
down on the 1958 Ross
Type BCF Exchanger.



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Here's a way to make your lost ceiling space pay off

# AMERICAN MONORAIL



Floor space is unobstructed, free of traffic with American MonoRail overhead handling.

increases plant capacity...
cuts handling costs...
reduces worker fatigue...
minimizes damage and loss.

You can get more profit out of your plant. American MonoRail Engineers can show you how to convert lost ceiling space—eliminate obstructive storage around machines—and gain additional operating area. Find out how you can process work in motion, cut down idle time, and assure safe handling of product. Work can be done at comfortable heights—worker fatigue lessened—heavy loads eliminated—and damage to product reduced.

Let American MonoRail Engineers plan your handling. Write for full information today.

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MONORAIL

MEMBER OF MATERIALS MANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION

MERICAN

# Plant Gains 5/8-Acre with an Armco Retaining Wall



# READY

This is the bank of the creek bordering the property of Industrial Forge & Steel, Inc., ready for assembly of an Armco Retaining Wall that will gain land for an expansion program.



# DONE

Job is complete, and the plant has gained more than half an acre from a formerly unusable stream slope. Also, the site is more attractive.

Industrial Forge & Steel, Inc., Canton, Ohio, needed more space for a plant expansion program. One way this could be done without the outright purchase of additional land was to reclaim the slopes of a creek bordering the property. But was this possible?

The Consulting Engineer recommended an Armco Bin-Type Retaining Wall to handle the job, With this prefabricated metal wall, installation could be made at the edge of the stream. And since the wall would rise almost vertically, the plant could make full use of the area.

The Armco Wall specified was 380 feet long, with heights ranging from 131/3 to 211/3 feet. The bank of the stream was cleared of brush, and excavation was made for assembly of the Armco Wall in position. Sections of the wall were bolted together, and the bins were filled with earth. To solve subdrainage problems, perforated pipe was installed behind the wall, with outlets emptying into the creek.

Armco Bin-Type Retaining Wall is one of more than 30 Armco products used in engineering and construction for industrial, municipal, highway and railway applications.



Same location, before work began. The plant of BEFORE Same location, before work began. The plant of the Industrial Forge & Steel Inc., can be seen only dimly through the brush at the edge of the stream.

Write for Data

ARMCO DRAINAGE & METAL PRODUCTS, INC.

DIXIE DIVISION

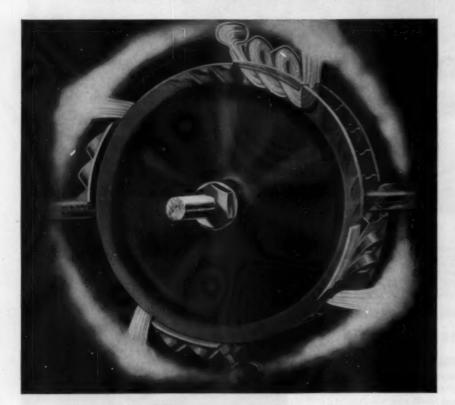
619 Forsyth Bldg. . Atlanta, Georgia SOUTHWESTERN DIVISION

C & I Life Bldg. • Houston, Texas Other Offices in Principal Cities

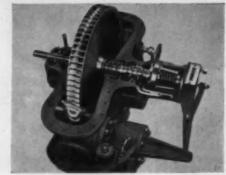
# Armco Construction Products



# TURBINE BLADES CAN'T FOUL!



The Terry solid-wheel turbine is of the impulse, helical flow type. The steam issues from an expanding nozzle at high velocity and enters the wheel bucket where its direction is reversed 180°. As this single reversal uses but a portion of the available energy, the steam is returned to the wheel several times until practically all of the energy has been utilized. This principle makes possible the efficient use of steam in a single-piece, almost indestructible wheel.





# Terry solid-wheel design permits large clearances

In the Terry solid-wheel turbine, the steam enters the buckets in a direction at right angles to the shaft, as shown above. This design eliminates the need for close clearances and provides positive blade protection.

The blades cannot foul. There is a one inch clearance on either side of the wheel. In addition, projecting rims on each side of the buckets prevent damage to the blades even though external thrust should move the wheel.

This is only one of the many advantages of Terry solid-wheel turbines. Write for complete details, Ask for a copy of bulletin S-116.

THE TERRY STEAM TURBINE CO. TERRY SQUARE, HARTFORD 1, CONN.

SOUTHERN POWER & INDUSTRY for FEBRUARY, 1958

# Some Things to Think **About Steam Traps**

...in order to get high operating efficiency and a minimum of maintenance

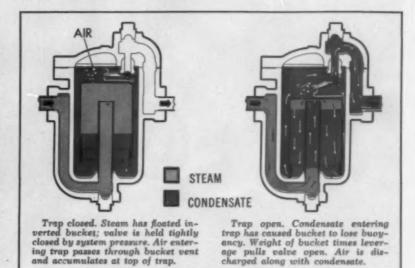
The gentleman who invented the wheel had a basic idea and so far no one has come up with anything better for the purpose.

If you'll pardon us for a little overemphasis on the significance of steam traps, we'd like to liken one of them to the wheel.

In 1911, when the first Armstrong inverted bucket steam trap model was announced to the world or at least that part of the world that modest advertising and sales budgets would cover, it was not received with equal enthusiasm by all (especially old-style trap makers). But, like the wheel, it managed to find its way into gen-eral use. And, nothing better has ever turned up for the purpose of draining condensate. As a matter of fact, the Armstrong trap has been very widely copied. Today, there are more inverted bucket traps draining process equipment than any other kind. Of these, there are more Armstrongs.

If this sounds like the boasting of a proud parent, give consideration to some fundamental requirements not met by all traps:

- 1. A steam trap should not leak steam. Some traps do, you know, because of the nature of their operating principle. No steam ever gets to the Armstrong trap orifice. The valve is always water sealed.
- 2. A steam trap should vent "air" as fast as it accumulates otherwise temperatures are reduced and corrosion is a problem. The Armstrong trap handles air very nicely. The vent in the bucket permits air to accumulate in the top of the trap, from where it is discharged when the trap opens. For extreme conditions like draining paper machine dryers, some jacketed kettles and certain other units, the vent is sized larger for the job. And, for handling big volumes of air during warm-up, a bucket with an auxiliary thermic vent really speeds up heating.
- 3. A steam trap should dis-charge condensate at steam temperature if you want to get



maximum efficiency from the unit drained. And most people certainly do. If you have to wait for the condensate to cool, it's almost impossible to maintain maximum temperatures and prevent air build-up. You guessed it—the Armstrong trap opens for water, without dependence on tempera-

- 4. A steam trap should be suitable for any return system. The Armstrong trap works just the same whether discharging to atmosphere, back pressure or vac-uum. It has been conclusively proved that flash steam resulting from use of a bucket trap does not cause a problem in vacuum return systems. The flash condenses rapidly. It's the leaky traps that cause the headaches.
- 5. A steam trap should not be a "prima donna". Some kinds of traps take an awful lot of care and coddling. The Armstrong trap is a rough and ready type with a hardened chrome steel constitution (valve and seat, to be exact). It cleans itself of ordinary dirt and scale without choking up. Its 18-8 stainless parts stave off rust and corrosion. It resists wire-drawing and wear remarkably well. In fact,

it stays on the job longer with less attention than any trap ever produced. Unless you live in Siberia, you can probably find a user around the corner who will tell you so from experience.

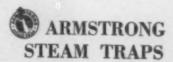
age pulls valve open. Air is dis-

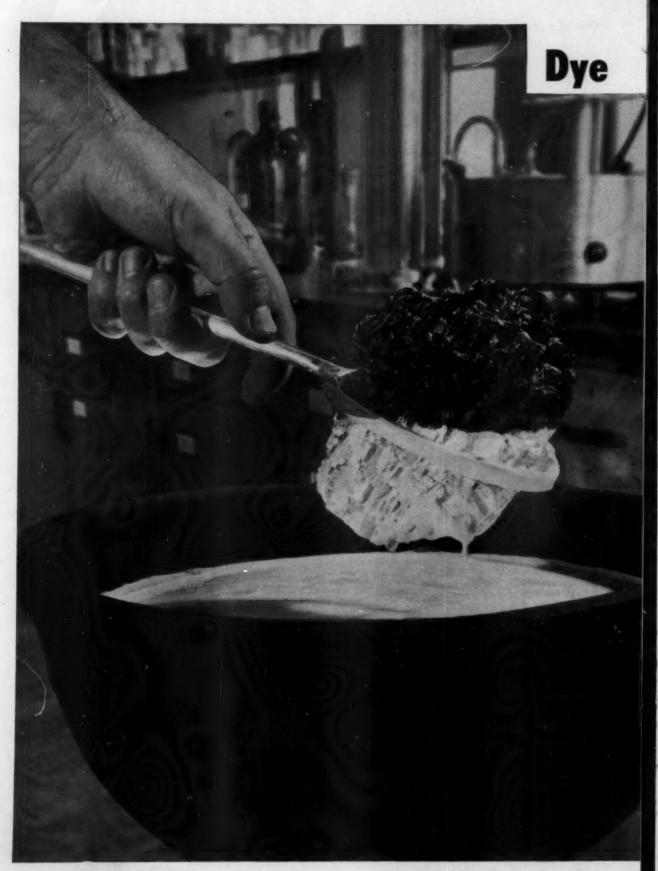
charged along with condensate.

- 6. A trap should not be an "orphan". With Armstrong traps you can always get prompt service and parts from nearby Factory Representatives and stocking distributors as well as from the fac-
- 7. A trap should have a guarantee. The Armstrong trap is unconditionally guaranteed to give you complete satisfaction (as to doing its job, that is). If it doesn't, you can get your money back.

If you'd like to buy some of these excellent steam traps, call your local Armstrong Representative or write Armstrong Machine Works, 8061 Maple St., Three Rivers, Michigan.

ASK FOR the 44-page Steam Trap Book, free on request without obligation.





# maker brightens fuel cost picture

# Burning coal at Toms River-Cincinnati saves 20% on fuel costs, permits <u>clean</u> steam generation

The Toms River-Cincinnati Chemical Corp. plant in Toms River, N.J. is the most modern plant of its kind in the world. Producing vat dyestuffs requires a large dependable steam supply for chemical processes and heating purposes. To fill these requirements, the power plant at Toms River-Cincinnati is as up-to-date and efficient as the general plant itself. The fuel used for steam generation is coal because, on the basis of cost per thousand pounds of steam, the nearest competitive fuel costs 20% more than coal. In addition, thanks to automatic operation and modern equipment, the power plant meets the rigid standards of cleanliness required in such manufacturing operations.

Facts you should know about coal

Not only is bituminous coal the lowestcost fuel in most industrial areas, as in the case of Toms River-Cincinnati, but up-to-date coal burning equipment can give you 15% to 50% more steam per dollar. Today's automatic equipment pares labor costs and eliminates smoke problems. And vast coal reserves plus mechanized production methods mean a constantly plentiful supply of coal at stable prices.

**Technical advisory service** 

The Bituminous Coal Institute offers a free technical advisory service on industrial fuel problems. We welcome the opportunity to work with you, your consulting engineers and architects. If you are concerned with steam costs, write to the address below. Or send for our case history booklet, complete with data sheets. You'll find it informative.

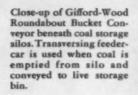
#### Consult an engineering firm

If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—will effect great savings for you in efficiency and fuel economy over the years.

# COAL INSTITUTE

Southern Building . Washington 5, D. C.

View of boiler room showing both 50,000 lbs. hr. boilers, by Riley Stoker Corp. Each has two burners. Center foreground is automatic weigh scale, by Richardson Scale Co., which receives coal through hopper from live storage bin and passes it to coal feeder. Coal is fed to Riley Pulverizer in basement, then blown back up to burners.



Automatic combustion control and instrument panel by Bailey Meter Co.

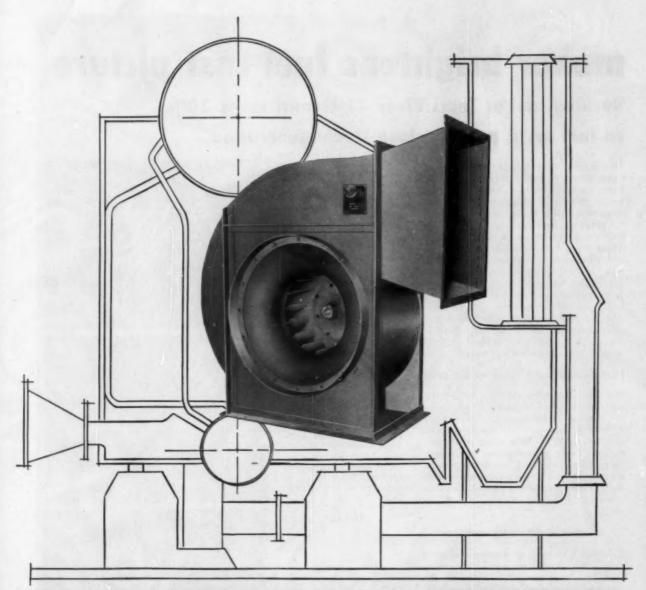
Fly ash being loaded on truck through a dustless rotary unloader. Fly ash is collected by Prat-Daniel Mechanical Precipitators. A pneumatic ash collecting system by United Conveyor (with tie-ins under air heater and at base of stack) removes it to this 20-ton ash silo. In the rear are three 330-ton coal silos.











# FOR ECONOMICAL MECHANICAL DRAFT SERVICE

"BUFFALO" TYPE "CR" RADIAL WHEEL DRAFT FANS

Combining sharply rising pressure and horsepower characteristics with high static efficiency and resistance to abrasive effects, the "CR" is an ideal fan for stoker-fired or pulverized coal boilers. It is also proving an excellent choice for handling air with dust loadings in a wide range of industrial jobs. Too, these same high-pressure, high-capacity characteristics may mean a

smaller fan for many direct-connected applications — a saving in first cost.

Write for Bulletin FD 205 and see the dependable, stable performance built into this husky radial wheel fan for constant volume or inlet-dampered operation. It's one of a series of specialized "Buffalo" Draft Fans—including airfoil and backward curve designs with a wide choice of wheels—to give you the best service your operation requires.

NOTE: Every "Buffalo" Fan has the exclusive "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.

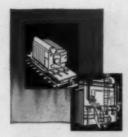
# BUFFALO FORGE COMPANY

BUFFALO, N. Y.

Buffalo)

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING



# HEAT ENGINEERING by FW

# extends Central Station Reliability to Standard INDUSTRIAL and

**PACKAGED UNITS** 

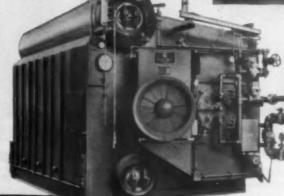
PACKAGED STEAM GENERATORS of the water-tube type were introduced by Foster Wheeler in 1940 — combining in a single, compact, shop-assembled unit, all the necessary facilities for the dependable and economical generation of industrial steam. Continual research and development have resulted in further improvements in design and construction, and today the FW line of Packaged Steam Generators, in capacities from 10,000 to 60,000 lb/hr, represents the last

word in modern steam plant design, reflecting over half a century of service to the power generation industry. Features include 36," steam drum and 24" water drum, staggered boiler tubes, closely spaced waterwall tubes, water-cooled target wall, and wide choice of burners and controls. For further details, send for Bulletin PG-55-3.

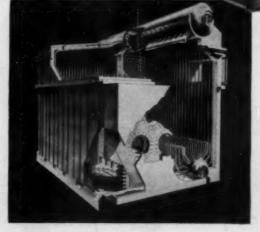


Abeve: Two FW packaged boilers — the first ever of-fered to industry — were installed for oil field drilling operations in 1940. They are still in service, delivering low-cost steam.

Left: New Foster Wheeler series AG-100 Packaged Steam Generator.



Cutaway view of typical FW Standard Steam Generator.



STANDARD PRE-ENGINEERED UNITS by Foster Wheeler offer all the advantages and economies of standardization for larger industrial steam generators of from 50,000 lb/hr to 450,000 lb/hr capacity. The new FW line of "SC" and "SD" standard units is heat engineered to the same standards of dependability and performance which have made Foster Wheeler steam generators first choice in many of the leading central station plants throughout the country. Features include completely water cooled walls, efficient firing arrangement, fully drainable superheater, high steam purity, unrestricted circulation, pressure-tight construction and minimum refractory baffling. For further details, send for Bulletin B-55-4. Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N. Y.

# FOSTER WHEELER

NEW YORK . LONDON . PARIS . ST. CATHARINES, ONT.

#### For Fly Ash Collection ...

Western Precipitation

presents

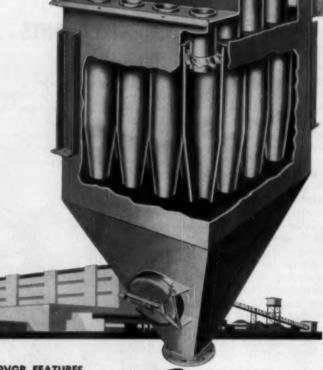
its latest development

in a quarter-century of

continuous advancement

in Mechanical Collectors

...The "9VGR"
MULTICLONE!



# Over 25 years ago

Western Precipitation Corporation pioneered the high-efficiency multipletube principle that has proven so superior it is now the pattern for the industry.

The Multiclone continues to be years ahead of all other centrifugal collectors because it incorporates the invaluable "know-how" gained through these many years of leadership in the field—leadership that is further emphasized by introduction of the 9VGR Multiclone, another important milestone in Multiclone's quarter-century of outstanding performance.



COTTRELL Electrical Precipitate to MULTICLONE Mechanical Collects CMP Combination Units DUALAIRE Reverse Jet Filters

#### NEW 9VGR FEATURES . . .

- 1. No need for continuous external support.
- 2. Easier and less costly to insulate.
- 3. Minimum dust stratification.
- 4. Improved dust distribution to all tubes.
- 5. Simpler installation, lower erection costs.
- Freedom from leakage at all critical points so that full collection efficiency is obtained,

# Puss The proven superiority of CAST IRON TUBES and VANES!

Through the years, others have tried special alloy steels and so-called "miracle" metals, but nothing has proven as satisfactory in actual field service as cast iron. In the past quarter-century more than 270,000 Multiclone tubes have been placed in service with less than 1.85% replacement—a performance record unequalled in the industry!

There are many other advantages built into the 9VGR. There is a Multiclone representative near you who will be glad to supply complete details. Or write direct, asking for your free copy of Bulletin #M209 which contains full details.

# Western Precipitation Corporation

Designers and Manufacturers of Equipment for Collection of Suspended Material from Gaser ... and Equipment for the Process Industries

Main Offices: 1052 WEST NINTH STREET, LOS ANGELES 54, CALIFORNIA
Chrysler Building, New York 17 • 1 North La Salle Street Building, Chicago 2 • Oliver Building,
Pittsburgh 22 • 3252 Peachtree Road N. E., Atlanta 5 • Hobart Building, San Francisco 4
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Representatives in all principal cities



# A dangerous place to work... that's why you see so many symbols of safety

Here's a plant that's out to keep "employee downtime" at a minimum. Extinguishers and gas masks provide protection against fire and toxic fumes. Guard rails and chains surround permanent hazards. Raised steel strips around floor openings prevent objects rolling or being kicked to the floor below. Clean windows and bright lighting provide good visibility. It's only natural that a company so interested in safety should select Blaw-Knox Electroforged® Steel Grating for "underfoot" safety.

Each section of Blaw-Knox Steel Grating is of rigid, one-piece construction. Choice of cross bar and bearing bar designs and spacings affords maximum safety under all working conditions. Indoors or out, you get safe, quiet, long lasting and self-cleaning flooring with maximum passage of light and air.

Blaw-Knox Electroforged Steel Grating is fabricated in a wide selection of materials to exact customer specifications. Fits easily and neatly into even the most congested areas.

Send for new Blaw-Knox Grating Catalog 2527. See new ideas in flooring, walkways, stair treads, platforms, shelving. Write today.



# **BLAW-KNOX COMPANY**

Blaw-Knox Equipment Division . Dept. K, Pittsburgh 38, Pa.

# BROWN BOVERI AIRBLAST BREAKERS



14.4 kV Generator Breaker in Flatiron Power Station of Bureau of Reclamation.

345 kV, 3-cycle Airblast Breaker, 25,000,000 kVA interrupting capacity, in service at E. Lima substation, Ohio Power Company. Largest Airblast Breaker ever installed in U.S.

13.8 kV to 345 kV!

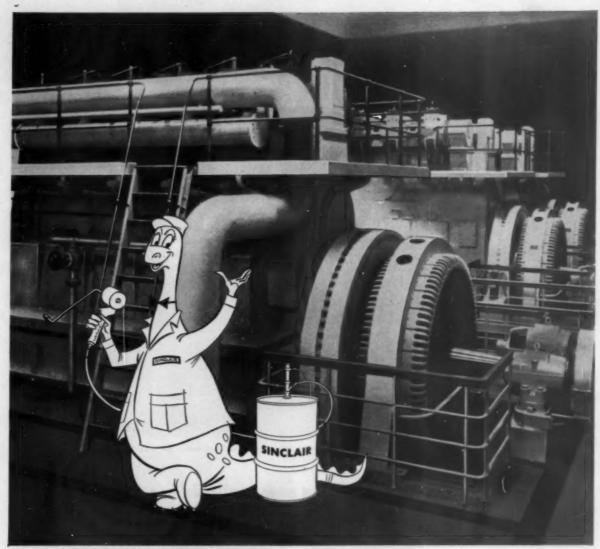
BROWN BOVERI

**BROWN BOVERI CORPORATION** 

19 Rector Street

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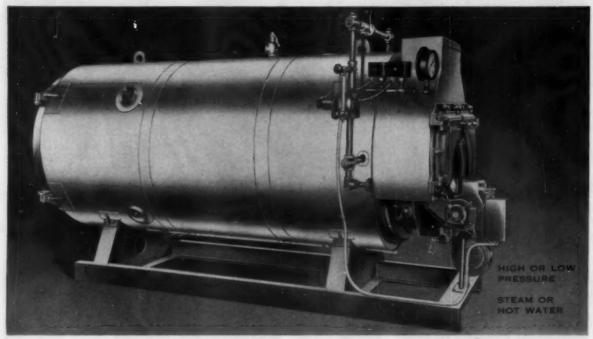
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NOWless oil consumption Sinclair RUBILENE® Oil has a great reputation in industrial Diesel applications — and for several good reasons. Engineers have found that Sinclair RUBILENE can cut oil consumption, reduce service time to a minimum. It prevents the formation of harmful carbon, sludge and varnish. It stands up under the highest operating temperatures, provides better lubrication protection to cylinders, pistons, rings and other vital moving parts.

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# SINCLAIR RUBILENE OILS

# announcing 3 new Kewaree



Kewanee low pressure boiler with Iron Fireman MicroMist forced draft burner for heavy oil.

## All advantages of forced draft firing now available in smaller size series

READ THESE SPECIFICATIONS. SIZE RANGE: 18 to 92 bhp. FUELS: Light or heavy oils, gas, or combination oil-gas. FACTORY ASSEMBLY: All models available factory assembled as complete package units, ready for service connections on job.

In the new Kewanee-Iron Fireman series of package units, the important advantages of forced draft firing are extended to the small "Scottie, Jr." sizes. Thoroughly proved in worldwide installations of larger size units, this new series makes forced draft firing, with all its benefits, available for smaller boiler plants.

Forced draft advantages. Forced draft firing has many inherent advantages over other methods of gas or oil combustion.

With these units there is a 50% saving in electrical power for operating motors. This is important, particularly in the larger sizes. More positive regulation is assured by controlling the air at room temperature, rather than at exit gas temperature. Equipment is smaller and requires less maintenance. In addition, a forced draft unit

is much quieter than a natural or induced draft unit. No high stack needed; requires only a vent pipe.

Boilers and burners conservatively rated. There is an ample reserve capacity beyond the rated output. Normal load is carried at a comfortable "cruising speed." This assures long life with low maintenance costs. Units operate at well above 80% efficiency even at 50% above the Steel Boiler Institute rating.

Only service connections required. All boiler fittings, automatic burner controls, fuel and air systems are installed and tested at factory. Units are fire tested and shipped as a unit if desired, or boiler and burner may be shipped separately if it is necessary to protect the burner from weather or vandalism during construction.

# **IRON FIREMAN forced draft package units**

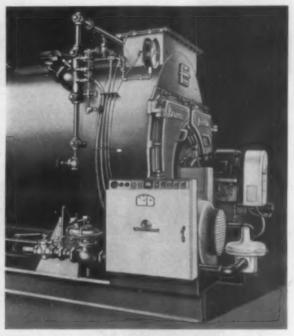
High or low pressure, steam or hot water boilers . . . all sizes, all fuels . . . ready to hook up and GO

Light oil, gas or gas-oil. The Iron Fireman WhirlBlast burner is a new and advanced design. Its most outstanding feature is its ability to fire, with high efficiency, either gas or oil in a sealed combustion chamber, without flame pulsation. It is a true forced draft burner operating under firebox pressure. On dual fuel models, fuels are changed without mechanical adjustment, either through automatic controls or with the flick of a switch. From 18 to 92 bhp.

Heavy oil burner for smaller boilers. The ability to fire either heavy or light oils and to modulate over a wide range are the two outstanding features that make the MicroMist burner unique in its field. Its most notable feature is a twostage supercharger atomizing principle which converts fuel oils, up to and including No. 5, to an air-oil mist that is readily ignited by an electric spark. No gas pilot required. For boilers from 18 to 92 bhp. No. 6 oil or lighter-gas or gas-oil. This burner is designed for larger size boilers. Oil models incorporate the famous Iron Fireman horizontal rotary burner with Volumeter oil control, which accurately meters, by positive displacement, all grades of oil. The integrated ring type gas burner operates at highest efficiency at the same input ratings as are developed with oil. Available in sixteen sizes with capacity ranging from 59 bhp to 651 bhp.



Iron Fireman WhiriBlast burner (described above) fires either gas or light oil, or combination oil and gas, under forced draft. This is a new Iron Fireman development; never before available in the medium size range.



The Iron Fireman retary ferced draft burner (described above) fires any grade of oil, gas or gas-oil combination. It includes centrol panel, air and fuel systems. Control instruments are wired and tested at factory.



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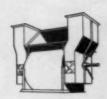
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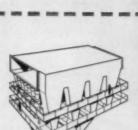
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## **Books for the Plant Engineer**

#### Elements of Engineering Thermodynamics

By Rolf H. Sabersky, Assoc. Prof. of Mechanical Engineering, California Institute of Technology; Published by McGraw-Hill Book Co... Inc., 330 West 42nd St., New York 36, N. Y.; 309 pages; Price, \$7.50.

Text is designed for the first course in thermodynamics. The basic laws are stated, and their experimental foundations are discussed. In deriving consequences from the basic laws, the assumptions are emphasized and care has been exercised to distinguish clearly between the basic laws and derived relationships which are valid in more restricted cases only.

#### **Mechanics for Engineers**

By Ferdinand P. Beer, Professor Mechanics, Lehigh University and E. Russell Johnston, Jr., Assoc. Prof. of Civil Engineering, Lehigh University; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y., 673 pages; Price, \$8.00.

Written on an intermediate level, the book's objective is to provide complete coverage on statics and dynamics; to explain things in detail, as clearly and simply as possible while maintaining a high standard of accuracy; and to furnish carefully chosen illustrative examples and problems of unusual quality and interest

#### Turboblowers

By A. J. Stepanoff; Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.; 377 pages; Price, \$8.00.

Book deals with the hydrodynamic and thermodynamic aspects of the turboblower design. It emphasizes the unprecedented developments that have taken place during the last fifteen years in the field of application of turbomachinery for the compression of gases and vapors, outlines new methods of attack on turbomachine problems, and discusses the art of building turbocompressors in the United States and abroad. Also shows ways by which fan performance may be improved with little or no increase in costs.

#### Encyclopedia of American Associations

Published by Gale Research Co.. 247 Kenworth Road, Columbus 14, Ohio; Price, \$15.00.

Lists more than 7,000 trade, business, professional, scientific, labor, social welfare, fraternal, etc., organizations alphabetically by "key word," including headquarter address, principal officer, number of staff members, year founded, number of local groups, and general description outlining membership and purpose of group. Two additional supplemental sections included, giving subject and functional groupings and a semi-annual supplement.

#### Production Forecasting, Planning and Control

By E. H. Mac Niece: Published by John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y.; 360 pages; Price, \$8.25.

This book reduces the methods and techniques of production management to a set of principles, and then illustrates these principles with specific examples of effective applications. It approaches the subject from the engineering viewpoint but supplements this treatment with material on social and economic implications. As in the first edition, the text includes chapter summaries, questions, discussion cases, and a master problem at the end of the book.

#### Standard Handbook for Electrical Engineers

Editor-in-Chief, Archer E. Knowlton. Consulting Engineer; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.; 2,311 pages; Price, \$16.50.

This is the ninth edition of a standard reference work for all in the electrical engineering profession or for those whose work in industry or engineering touches on this field. It is a handy reference compilation of practical, usable data from all fields of electrical engineering practice, plus the most frequently required fundamental theory, units and systems of measurement, dependably presented by more than 100 engineers, scientists, teachers and other authorities.

#### Coal and Ash Storage and Handling

Published by **Bituminous Coal** Research, Inc., 121 Meyran Ave. at Forbes, Pittsburgh 13, Pa.; 12 pages; Price, \$0.35.

Manual prepared to aid architects, consulting engineers, contractors, and builders in the design and construction of coal and ash storage and handling facilities for the modern coal-burning boiler plant, using up to 5,000 tons of bituminous coal annually. Primary objective is to enable maximum automatic operation at a capital cost commensurate with the plant size.

#### **Tool Design**

By Cyril Donaldson and George H. LeCain, Mechanical Dept., Rochester Institute of Technology; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.; 550 pages; Price, \$6.75.

Complete text for a course in tool design was written especially for class study with questions, problems, drawing assignments, and references. In this second edition the material on punches and dies, theory of cutting tools, jigs and fixtures, and screw machines has been rewritten and expanded. The tool materials section has been largely revised and a special table aids the beginner in choosing materials at the beginning of a design. New derivations of formulas have been added to the chapter on gages.

Engineers whose work concerns tools, jigs and fixtures, gages, etc., as well as those who must work with or supervise tool designers, will find this work most helpful.

#### Thermodynamics

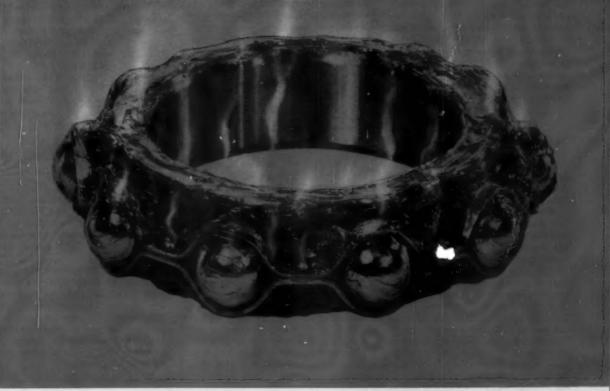
By Virgil Moring Faires. Prof. of Mechanical Engineering, North Carolina State College; Published by The Macmillan Co., 60 Fifth Avenue, New York 11, N. Y.; 519 pages; Price, \$7.50.

This book offers a theoretical treatment of thermodynamics in context with enough applications to motivate the reader's comprehension. It is preparatory for advance study, but at the same time provides a satisfactory terminal course which emphasizes that which is most useful to most engineers.

(Continued on page 113)

RESISTS COLD





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HEAT, COLD, WATER—new Gulfcrown grease works under conditions where many other greases fail!

This superior new lithium-base lubricant resists leakage—has excellent high temperature performance. It has excellent pumpability at 0°F (even lower under certain conditions). It resists removal from bearing surfaces even when washed with water. It can be applied from a centralized grease system or by grease gun.

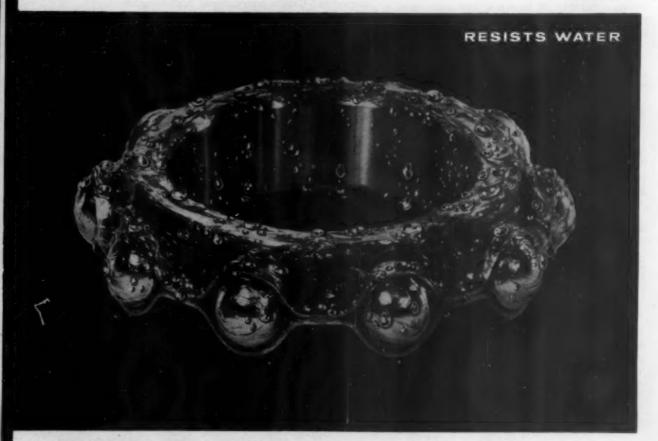
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# TIMELY COMMENTS



## **Product & Method Trends**

Highlights of a few of the new structural materials and products exhibited at the recent 26th Exposition of Chemical Industries.

ONE THING often leads to another. Capacitors have been known in many ways as electrical shock absorbers and counterbalances for many years, but the development of the tiny transistor called for miniturization; along with printed circuitry, it threw a great deal of electrical design out of symmetry.

In the case of the capacitor, it stimulated the employment of **tanalum**, whose properties are highly favorable for that use, especially where reliability is essential and high temperatures are encountered, but where space saving is paramount.

Tantalum compares with mild steel in workability, but is chemically inert, which especially recommends it for plant equipment subject to corrosive influences. Tantalum condensers are now being made.

Titanium — light, tough, strong and highly resistant to corrosion, has hit the price slide, due to increased production. It runs about \$10.60 per pound currently, compared with \$25.00 a pound in 1950.

Extinguishing agents for metal fires — magnesium, titanium and zirconium are highly flammable. Compared with other extinguishants in respect to this hazard, TMB liquid forms a molten coating that excludes the atmosphere from metal fires, giving off fumes that are virtually non-toxic.

Plastic applications included a new in-plant or outside contract service in the application of "cementable" Teflon by a new process which permanently bonds thin sheets or tapes of Teflon to wood, glass, steel, aluminum, copper, or ceramics.

Pump design — new sealless pump consists of one stationary and one moving part. The

pump body is offered in a selection of materials — polyethylene, PVC, Bakelite, Buna N, Teflon or stainless. The flex-i-liner, which is the operating part, can be had in natural or synthetic rubber, Neoprene, Hypalon, Kel F, Butyl, Compar or Silicone.

Glass reinforced epoxy pipe, centrifugally cast around a braided sleeve, is claimed to be the only plastic pipe which can be used above 220 F or 1000 psi. It costs less than corrosion-resistant metal pipe of the same size, is a non-conductor, free from electrolytic action and has less than one-fourth the weight of steel.

Pyroceram is the name given to a new series of extremely hard, fine-grain materials in the glass family having a wide range of physical properties. Unlike conventional high-temperature, low-expansion ceramics, the new material can be formed while in its glassy state into a variety of shapes and sizes by all known glass forming techniques.

Urethane plastics (polyurethanes) are being manufactured as foams, adhesives and coatings. The foams can be used for positioning parts within a container — as in packaging.

## Quality ... Not Quantity

THOSE wanting more federal aid in the engineering and scientific educational field should remember that technological developments such as guided missiles depend on highly-advanced technology, and that a mere increase in numbers of those with degrees will not provide the type of knowledge which is necessary.

Dr. Clark A. Dunn of Oklahoma State University's Engineering Experiment Station, points out that "studies of the Society (National Society of Professional Engineers) over a long period have indicated that the emphasis in science and engineering should be on quality rather than quantity.

## MANAGEMENT

## CLINIC



Conducted by ROBERT H. EMERICK, North Charleston, S. C.

#### Question

WE ARE a small company engaged in heavy manufacturing, and the safety record of our shops is not as good as we feel it should be. Since our size does not justify a full time safety engineer, we have consulted with neighboring industries and have tried various expedients they recommended to us.

These have included placing a stuffed skunk or a large 8-ball on the desk of a department or shop head whose people have had a lost time accident. These devices brought nothing but flat refusals to cooperate from the supervisors involved; they called the schemes degrading, and one promised to drop the 8-ball on somebody's toe if he had to, to get it off his desk.

We purchase many safety posters, and all employees are given a 5 minute safety talk every Monday morning. These measures are good, but what we want is a more positive approach that can make safety a personal goal for every individual on our payroll.

Any suggestion you can make will be appreciated.

#### Suggestion

YOUR experience with the skunk and 8-ball duplicate reactions reported by others.

An accident is never funny.

Some companies have done well by making safety a matter of inter-department competition. A suitable plaque is the prize, and the department with the best safety record, based on man-hours worked, is allowed to display the plaque for a year, or until another department comes up with a better record. In the event of a tie, the display time is divided.

Another effective practice for small concerns, is to form a Safety Committee of employees, charged with investigating accidents, making safety suggestions, and reporting to Management as necessary. Three members is a good number, with one acting as Chairman, and membership should be rotated so that no one person serves more than one year. This spreads the interest.

A third suggestion that makes safety deeply personal, is to initiate a "key" program. A man who goes 5 years without a lost time accident is awarded a certificate which states he is a key man in safe practices. After 10 years of no accidents, he wins an iron key, for 15 years a nickel plated key; a silver key comes with 20 years and for 25 years or more, a gold plated "master safety key." Keys are awarded when earned in a suitable departmental ceremony.

All safety programs must consider the accident repeater. Some individuals are definitely accident prone, psychologists say it comes from deep emotional disturbances, and these persons must be transferred to other work, or released.

The Clinic suggests you examine your records to determine if you have repeaters, and how many. Any person who suffers accidents more often than once in five years is a suspect. Either he doesn't know his work, or he is likely to be accident prone.



# **INDUSTRY SPEAKS**

## We're Playing a New Ball Game

INDUSTRY must realize that it is "playing in an entirely new ball game — one in which things are just moving faster — mentally, mechanically and psychologically; where national defense may hinge on a mere handful of missiles and where, in industry, almost anything is cheaper than a customer complaint that may lead to lost business."

In elaborating on this statement before an American Management Association Conference on Quality Control, H. Thomas Hallowell, Jr., President of Standard Pressed Steel Co. emphasized that it's very timely to take a new look at the topic of quality.

Standards must be dynamic and it is management's job to see that they are kept in tune with the times. Today, however, in the atmosphere of higher cost trends with the increased tempo of technology — the higher speeds, the higher temperatures, the higher forces, make mistakes more and more expensive.

"Just when mistakes are becoming more costly, they are also becoming much more likely. That's the result of an increasing complexity of design, a growing number of parts, a multiplying quantity of mechanical and electrical, pneumatic, hydraulic and electronic components.

"Things are just getting more and more complicated."

Automation certainly demands increased reliability. As we string more and more machines together in an automated plant, more possibility of breakdowns automatically follows — and shutdowns are more costly if they do occur. By the time you have automated a production line you've invested so much capital that you can usually only afford one automated unit and it just has to work.

How about the maintenance of automated machine tools? It used to be that a good mechanic could do the job alone. But we've added electrical features, pneumatic controls, and finally hydraulic and electronic elements — too often all on the same machine. It now may take as many as five experts to repair something for us — and a sixth to tell us which expert to call in the first place — if we're fortunate enough to have that type of a sixth expert!

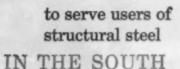
Then there's miniaturization — that irrepressible need to do more with less — less space, less mass. When we're miniaturizing, in most cases, we're simply cutting down on the factors of safety, the margins for error. We cannot afford the luxury of unknowns. We need increased reliability and we can get it by increased product performance knowledge under working conditions.

Most of all, Hallowell felt the need for industrial and business management that lives and breathes quality. "Reliability must emanate from the top in order to permeate an entire industrial organization."

"Product reliability of tomorrow will be a direct reflection of the management reliability of today," he added.

As parts of the new age of reliability, Hallowell predicted an increasing trend to buy "brand name" in the industrial goods field, a growing demand for reliability data from materials and parts suppliers, and more widespread use of industry product-qualification procedure such as now used in the aircraft manufacturing field.

Management, he thought, would have to adopt a quality frame of mind, insure a flow of capital investment into the new tools and techniques of quality control and work more vigorously for sound, yet economical, industry standards.

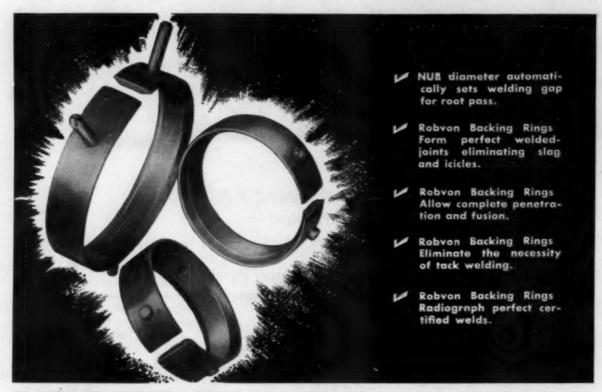


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Available in carbon steel, wrought iron, chrome alloys stainless steel, aluminum and copper

TYPE CCC

Designed for quick easy alignment of pipe where the variation in inside diameters is relatively great. Chamfered NUBS allow close tolerance fit-up and CLEAN STRIKE OFF. The ROBVON NUB conforms to the diameter of weld rod. ROBVON rings are beveled to assure non-restricted fluid flow.

TYPE CC

Designed to allow quick easy alignment of pipe where the inside diameters are slightly out of round. The welder has the choice of "STRIKING OFF" the NUBS or leaving them intact to be melted into the weld mass of the first root pass.

TYPE C

Designed for precise close tolerance fit-up. Type "C" NUBS conform to the diameter of the weld root. The NUBS melt with the metal to give complete penetration and fusion.

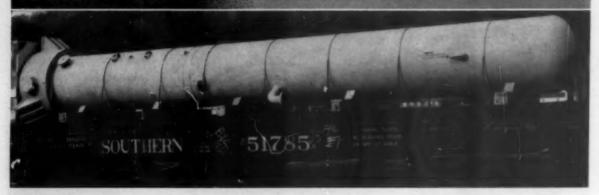
Robvon also manufactures machined rings to customer's specifications All fabricated solid machined rings x-rayed. Write for full information



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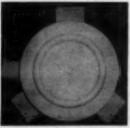
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#### PROGRESS IN POWER ODGOOD PROGRESS IN HEAT TRANSFER EQUIPMENT





Workman welding copper-nickel tubes to foot-thick steel tube sheet with 140-monel electrodes. Under destructive testing, rolled joints and tubes welded with cupro nickel rods leaked at elevated pressures, but tubes welded with 140-monel electrodes were leakproof at 9600 psi.



End view showing torus ring welded to channel and channel cover. Access to head is obtained by cutting ring with special rool; torus ring can be re-used. Conventional split key ring assembly taking the load on the cover is retained.

## FIRST ALL-WELDED FEEDWATER HEATERS

▶ A few years ago, an all-welded feedwater heater for 3600 psi and 790 F would have been called a fantastic dream.

Yet six all-welded feedwater heaters in this pressure-temperature range are now proving their worth in the Linden, N. J., Generating Station of the Public Service Electric and Gas Company. Designed and manufactured by the Yuba Heat Transfer Division, formerly the Heat Exchanger Division of The Lummus Co., these heaters represent one of the many "firsts" contributed by this organization to the progress of the power industry.

In the heater shown above, two 50-inch-diameter cylinder sections of 11/6-inch carbon steel were welded together. The open ends of the U-bends are welded, not roller-expanded, into the tube sheet (see upper small photo). Heads are sealed by a steel torus ring welded to channel cover and channel (see lower small photo).

The all-welded design minimizes the leakage which occurs in the conventional bolted and gasketed construction under high temperatures and pressures. Results are reduced maintenance and downtime.

This all-welded construction has been so successful it is certain to be specified for practically all future installations. Yuba engineers would be pleased to work with you. Call on them.

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FREDWATER MEATERS - SAROMETRIC CONDENSERS

### Conference at North Carolina State College, Raleigh, N. C.



Program Speakers at two-day Conference on Electrical Equipment at N. C. State College

Front row (left to right): George V. Fowler, Henderson Cotton Mills, Henderson; E. R. Burgin, I-T-E Circuit Breaker Company, Philadelphia; C. L. Griffin, General Electric Company, Schenectady, N. Y.; E. P. Turner, Diehl Manufacturing Company, Somerville, N. J.; Morris Gelders. Lockwood-Greene, Engineers, Spartanburg, S. C.

Back row (left to right): Richard Lloyd, National Bureau of Standards, Washington, D. C.; Dr. George B. Hoadley, head of Electrical Engineering Dept., N. C. State College; M. R. Brice, Cutler-Hammer, Inc., Milwaukee, Wis.; C. G. Helmick, Westinghouse Electric Corporation, East Pittsburgh, Pa.; and Milton C. May, Southern Power and Industry, Charlotte.

# Electrical Applications to Meet New Needs

APPROXIMATELY 225 engineers attending the Textile Electrical Conference sponsored by the American Institute of Electrical Engineers at North Carolina State College heard papers dealing with new needs, new equipment, new applications, and modernizations.

Speakers covered such subjects as: Co-Ordination of Circuit Breakers and Fuses, Maintenance, A. C. Group Drives, Clutch-Brake Motor Applications, Engineering Approach to Materials Handling, Fundamentals of D. C. Circuits and D. C. Motors, Basis Motor Control Circuits, An Ideal Electrical Layout, and Modernization of Electric Applications.

MILTON C. MAY, field editor for SOUTHERN POWER & IN-

DUSTRY in the Carolina area, discussed new developments in the industry and showed how engineers can only keep pace with what is new by reading most recent manufacturers' literature and monthly publications rather than depending on textbook information and school training.

E. R. BURGIN of I-T-E Circuit

Breaker Co. gave extensive technical data on low voltage air circuit breakers and fuses and discussed what they will and will not do. He summed up his comments with the following remarks:

"1. Effective reliable coordination of standard low voltage cartridge fuses and low voltage circuit breakers is not possible at the present time with information now available.

"2. Effective reliable coordination of standard low voltage fuses and circuit breakers on circuits of specified interrupting capacity may be possible in the near future. The publication of a NEMA standard FU 1-1957 in May, 1957 should help considerably in this respect. This will establish standards for ratings, interrupting capacities, and test procedures for Low Voltage Cartridge Fuses. In addition, proposed NEMA standards for current limiting fuses are being developed.

"3. The effective coordination of current limiting fuses and low voltage air circuit breakers is possible and practical. The combining of a low voltage circuit breaker and current limiting fuse into one integral unit indicates that such coordination is practical."

C. L. GRIFFIN, JR. of General Electric Company presented information primarily to aid tex-



Members of the Textile Sub-Committee present at AIEE Conference at N. C. State College.

First row (left to right): R. S. Gardner, AIEE Headquarters, New York; I. S. Bull, Roberts Co., Sanford; R. B. Flowers, General Electric Co., Atlanta, Ga.; R. H. Clark, Warner and Swasey Company, Cleveland, Ohio; Swaffield Cowan, Factory Insurance Association, Charlotte; Howard E. Strock, E. H. Gilliam Company, Charlotte.

Second row (left to right): Victor Sepavich, Crompton and Knowles Corp., Worcester, Mass.; R. B. Wood, Albany Felt Company, Albany, N. Y.; M. R. Brice, Cutler-Hammer, Inc., Milwaukee, Wis.; C. R. Moore, American Viscose Corp., Philadelphia; J. T. Meador, Southern

Electric Service Company, Charlotte; G. C. Gaskin. J. E. Sirrine Company, Greenville, S. C.; J. M. Field. Burlington Industries, Greensboro.

Back row (left to right): A. T. Bacheler. Westinghouse Electric Corp., Buffalo, N. Y.; John Bina, Dominion Textile, Montreal, Canada; Barney Stratton. Cutler-Hammer, Inc., Atlanta, Ga.; Robert R. Prechter. General Electric Company, Atlanta, Ga.; C. E. Robinson, Reliance Electrical and Engineering Company, Cleveland, Ohio; Dan McConnell, Southern Electrical Equipment Company, Charlotte; and L. C. Moore, Westinghouse Electric Corporation, Atlanta.

tile electrical maintenance. Salient points of his discussion apply also to electrical equipment in general.

"Productive maintenance is being accepted and practiced by more and more mills every year. Productive maintenance isn't new. Basically, it is simply a means of controlling electrical system outages through the planned application of men, material, and tools to help protect capital investment, increase production, and lower product costs.

"What is new, is the organization of this idea into a simple sequence of steps. These steps are:

- Gather complete equipment data.
- Determine the extent of routine maintenance.
- Establish a routine operatingcontrol system.
- Evaluate for critical maintenance.
- 5. Establish a critical maintenance program."
- C. B. PUTNEY of E. I. du Pont de Nemours & Co., Inc., presented several specific examples showing how "a broad engineer-

ing approach" in the field of materials handling and packaging resulted in outstanding savings.

"On one job, one of our engineers was requested to prepare specifications for unit containers, a fork lift truck, and a monorail hoist system. This equipment was to be used for handling a granular solid in 4,000 lb lots from a hopper on ground level to another elevated hopper.

"Instead of blindly following these instructions, the materials handling engineer, trained in the broad-approach method, inquired into the operation to determine in complete detail the final contemplated use of the desired equipment. With an awareness of alternate handling methods, their limitations and costs, he was able to counter with a proposal for a pneumatic handling system.

"Tests were required to insure that material degradation (an inherent possibility with pneumatic conveyors) would not be outside of specifications. A high-spot economic comparison was made to show the advisability of financing the tests and considering the alternate method.

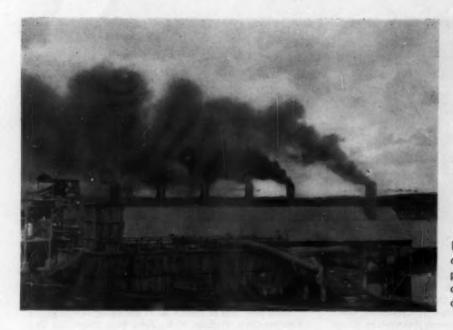
"As a result of this 'broad' approach, planned operating investment was reduced from \$27,000 to \$17,000; and annual operating costs from \$11,000 to \$3,500. In addition, the potential hazard of hoisting a 4,000 lb load was completely eliminated."

MORRIS V. GELDERS of Lockwood Greene Engineers, Inc. discussed "an ideal electrical layout." Explaining that since there are so many types, sizes, and physical arrangements of equipment, he defined the word "ideal" for the purpose of his paper as being "something very desirable," and enumerated the essential elements.

"Basically, any electrical system can be termed ideal which provides adequately for the following:

- Safety to personnel and equipment.
- 2. Uninterrupted production.
- Long life and low maintenance cost of equipment.

(Conference Report) (Continued on page 104)



COLLECTOR NOT OPERATING

Effluent from the kilns of this plant was approximately 50,000 cfm at a temperature of around 400 F.

Bremo Bluff, Virginia . . .

# DUST CONTROL -- Wet Collector Has Wide Process Applications

By HARRY E. SEIFERT
Director, Process Engineering Division
Southern Lightweight Aggregate Corp., Richmond, Virginia



AN UNUSUAL wet dust collector,

designed for and successfully used in the lightweight aggregate industry for the past five years, is finding increased application in other Southern process industries.

One of the original installations was designed for collecting light-weight aggregate dusts at the Bremo Bluff, Virginia plant of the Southern Lightweight Aggregate Corp.

Lightweight aggregate, a product of thermal expansion, is produced by the Southern Lightweight Aggregate Corp. in their Virginia and Carolina plants by heating slate to approximately 2000 F. Rotary kilns, in which the slate

Interior view of collector showing a baffle, concrete base and drain.

#### WET COLLECTOR **OPERATING**

Collector has operated 4 years without repairs. Nearly 70 tons of dusts are collected every 24 hours.



is fed into one end and pulverized coal blown into the other end, are used to produce the bloating or expansion.

The finished product (a cellular structure marketed under the trade-name "Solite") is crushed and screened to various sizes to produce blocks, structural concrete, precast prestressed concrete and also different desired strengths. The advantages of using an expanded slate aggregate are many. Generally using a lightweight aggregate in concrete will save 1/3 to 1/2 weight of ordinary concrete but will be just as strong. Being chemically inert, there will be no disintegration or pop-outs such as occur in some masonry blocks. Furthermore, blocks made from this material are natural insulators and have excellent fireresistant and sound - absorbing qualities.

#### **Handling Aggregate Dusts**

The process at the Bremo Bluff one the fine material from the crushing of the slate and the

plant created a very serious atmospheric dust problem when the plant was first put into operation. This dust was from two sources

other the fly ash from the powdered fuel.

Two different types of cyclones were installed to eliminate the atmospheric pollution, but neither was satisfactory due to their ineffectiveness in collecting the small particles and due to the disintegration from the abrasive action of the dust. A commercial type wet collector was then tried but it disintegrated after it had been in operation six weeks due to the abrasive action of the dust and corrosive action of the acid formed from the sulfur in the coal.

Finally after considerable thought and planning, a special

wet collector was designed of specially treated wood for resistance to both heat and acid. The temperature of the gas entering the collector was 400 F. Instead of nails, wooden pegs were used to hold the structure together. Baffles are used inside the collector to guide the gas in such a way as to obtain a better wetting action of the dust by the spray noz-

One collector has been in operation 24 hours per day 365 days per year for over four years without repairs. Seventy tons of dusts are removed from the gas from

(Continued on page 104)



Side view of collector showing spray nozzle arrangement.

# Yorktown Station

By FRANK P. CROWELL and CHARLES B. BEVERAGE Superintendent Yorktown Power Station

Senior Engineer System Power Department



- Coke, Coal, Furnace Gas, Oil
- Controlled Circulation Boiler
- Liquid Cooled Armature Coils

VIRGINIA Electric and Power Company made a substantial addition to its system recently when the first of two 150,000 kw units was placed in service at its new Yorktown Power Station, near Yorktown, Virginia.

While actual site location was in part dictated by area load requirements, ease of connection to transmission facilities, and adequate condenser cooling water supply, primary importance was

the availability of a low-cost fuel from the American Oil Company's (Amoco) refinery located adjacent to the site.

The development of this site is one of the latest endeavors in our struggle to hold down the cost of electric generation. We have sought economies by construction of larger and more efficient generating units, by persistent efforts to obtain "fine coal" freight rates, by consideration of "mine-mouth" generation with high voltage transmission to load centers in order to save the sharply increasing cost of freight, and by efforts to obtain economical delivery of fuels other than coal.

Early in 1955, our Company entered into a mutually beneficial contract with Amoco. Under the terms of this agreement, we were to construct a major power station on property made available by Amoco and would purchase the entire refinery's residual by-products for use as boiler fuel. Amoco agreed to purchase its entire electrical power requirements from Vepco and was permitted to obtain its cooling water from our intake system.

Both companies gained distinct

economic benefits under the agreement. Amoco is assured of a steady market for its residual by-product (delayed coke) and surplus gas and obtains its cooling water with a minimum of facilities and reduced initial costs. In addition, it is assured of a dependable economical power supply.

Vepco in turn has gained a valuable high load factor industrial customer and has obtained a source of low-cost fuel equivalent to approximately 500 tons of coal per day which is one-half of the fuel requirements for the first unit. Vepco also obtained a major power station site in a rapidly expanding load area where good sites are extremely scarce.

#### **Preliminary Considerations**

Present and foreseeable economic conditions required that we find ways to continuously reduce the unit cost of the facilities required to supply the customer's electrical demand. The basic thought, therefore, in the design of the Yorktown Station was to erect a plant combining optimum ultimate economy with maximum reliability.

The initial unit, which was placed in commercial operation on July 25, 1957, consists of a 150,000 kw reheat turbine generator, and a 1,200,000 lb per hour controlled circulation steam generating unit. In laying out the station, provision was made for an ultimate development to six units. A second boiler-turbine-generator is now under construction, substantially duplicating the first unit.

#### **General Description**

The station is located on the south bank of the York River where it joins the Chesapeake Bay. The land which was originally at an approximate elevation of 10.5 ft above mean sea level was filled with material dredged from the circulating water intake and discharge channel to bring the greater part of the area up to 13.5 ft above mean sea level. This is 3½ ft above highest tide of record.

The station consists of a main building, river water intake structure, river water pump house, chlorination building, demineralization building, fire pump house, 100,000 gallon water storage facilities, ash silo, ash dewatering tank, garage for bulldozers, coal and coke handling equipment structures, track and reclaim hoppers, relay house, and substation.

The main power station building — 272 ft by 104 ft — is of steel frame construction with concrete slab and open bar grating levels, and a pre-cast concrete slab roof. The turbine room, auxiliary bay, bunker room, and firing aisle are totally enclosed with corrugated asbestos siding. The boiler room is of open construction, and is partially protected from the weather by a flat pre-cast concrete roof.

Due to estimated savings, 12-in. nominal diameter, cylindrical, spirally corrugated, 18 gauge, shell type cast-in-place concrete piling was used under the foundations instead of the usual slim tapered creosoted timber piling. High strength bolts were used instead of normal riveting in assembling the structural steel members. This was the first such application using bolting on our system, and from the experience gained, it will be used on all future jobs.

Attached to the east end of the main building is the Service Building; the ground floor area being utilized for shops and warehouse space. Housed on the second and third floors above these facilities are the offices, toilet and locker rooms, laboratory, assembly hall, and other miscellaneous facilities.

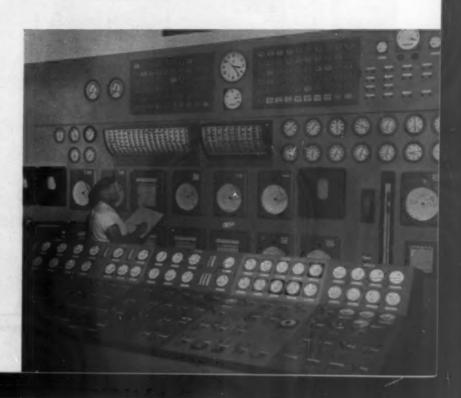
Other considerations in the general station layout are for providing a storage area for 60,000 tons of delayed coke, and 300,000 tons of coal. Railroad tracks for coal cars with a spur track into the ground floor of the main building are provided.

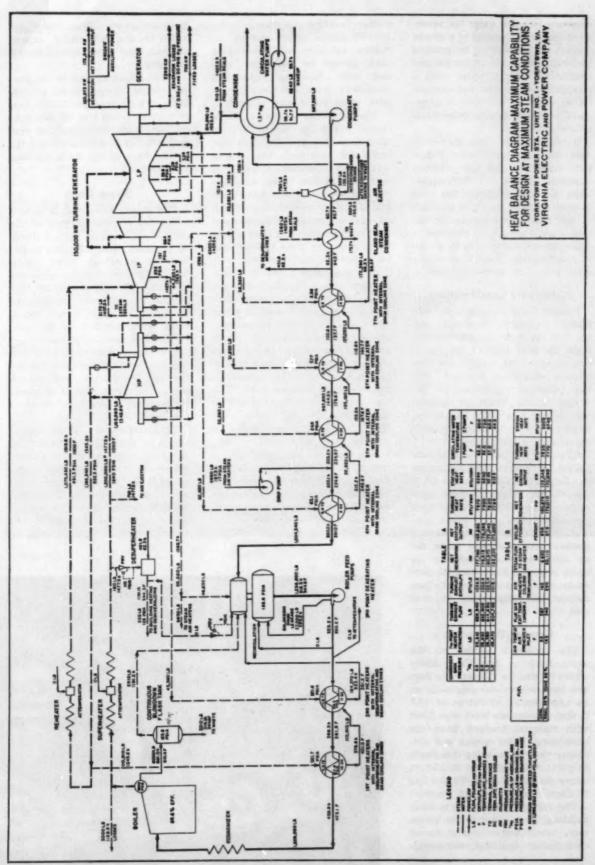
#### Steam Units

The steam generator is a C-E controlled circulation unit of the radiant reheat type, with a divided furnace, rated 1,200,000 lb per hour at superheat outlet conditions of 2000 psi gauge pressure, and 1000 F, with reheat at 1000 F. The two furnaces are separated by a common water cooled wall, with openings in the wall to equalize furnace pressure

The superheater consists of two sections, with desuperheat nozzles between the primary and secondary sections for control of steam temperature beyond the range of the tilting burners.

The temperature of the reheat steam is normally controlled by the position of the tilting burner. However, it is controlled automatically in an emergency under abnormal furnace slag conditions by desuperheating at the inlet of the reheater. The amount of sur-





Twin fuel feeder. Coal and coke flows from a partitioned bunker to separate scales and thence through a twin feeder to the individual pulverizers.

face is proportioned between the superheater and reheater so that the reheat steam temperature is slightly lower than the main steam temperature.

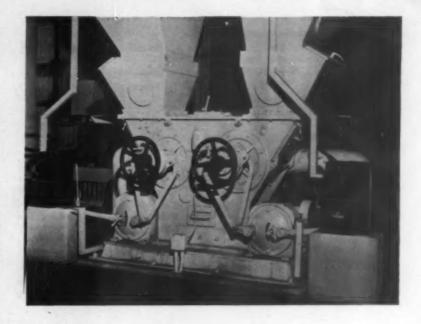
An economizer and two regenerative air preheaters are provided. Two constant speed, vane controlled motor driven forced draft fans supply combustion air. Two constant speed, vane controlled motor driven induced draft fans deliver the flue gas from the mechanical type dust collectors to a concrete chimney suitable for two boilers.

Boiler water is circulated in the boiler by three circulating water pumps, although for normal operations, only two pumps are required. Based on previous experience gained at our Possum Point Station, the original design called for pumps of the Westinghouse Canned Motor type. However, since the manufacturer could not meet the delivery date required, G-E-Ingersoll-Rand wet winding motor pumps were installed. Westinghouse Canned Motor Pumps are to be used on Unit No. 2.

A system of automatic sequential electricially operated air soot blowers is installed for cleaning the furnaces, superheater, reheater, economizer, and air preheater elements. The system includes two 1,037 cfm air compressors for 365 psi gage pressure, two aftercoolers, and two air receivers. The compressors are driven by 300 hp, 4160 v, synchronous motors. The entire system is remotely controlled from the central control room.

Television equipment is installed complete with cameras and receivers for observation in the control room of the boiler drum water level gauge glass, and furnace flame in each half of the divided furnace.

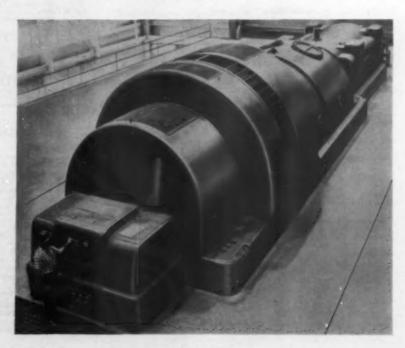
The pulverized fuel mixture — coal and coke — is fired in conventional tilting burners. Since delayed coke has certain undesirable chemical and physical properties, such as: its low volatile content;



wide range of ash fusion temperature; sulphur content, and the presence of vanadium, several features are incorporated in the design of the steam generator unit to counteract the possible effects of these properties. They are briefly as follows:

 The furnace is designed for approximately 10% lower heat release than normally employed for coal. The larger furnace volume reduces carbon loss by increasing retention time and also limits the temperature of the gas entering the superheater and reheater to 1150 F and thereby minimizes the possibility of vanadium sodium attack.

The vulnerability of the superheater to the vanadium sodium attack is further minimized by employing water cooled spacers and hangers and avoiding the use of alloys containing nickel and molybdenum.



3. The induced draft ducts, air preheater rotor, intermediate and cold end elements and housing, the mechanical dust collector housing and hopper were constructed of Corten, a corrosive resistent material, to minimize the vanadium sodium attack. To further protect the air preheater, an oversized steam air heater is installed so that a mean cold end metal temperature can be maintained above 245 F. Steam from the third point extraction is used under normal operation for steam air heating. For starting up and very low load operations, steam from the main auxiliary header is used.

 Elements in the high temperature section of the superheater are installed on 16" centers, while open spacing of those in the

## TYPICAL ANALYSIS OF DELAYED COKE AND WEST VIRGINIA BITUMINOUS COAL

		DELAYED
	COAL	COKE
MOISTURE	4.00	4.00
VOLATILE MAT	31.00	11,00
FIXED CARBON		
ASH	8.00	0.80
BTU (AS FIRED)	18,500	14,830
BTU (DRY)	14,060	18,450
SULFUR	1.10	4.50
GRINDABILITY	55	90
ASH SOFT, TEMP,	2650	2200-2700
VANADIUM	ment.	.1 to .8
SODIUM	-	.02 to .05
BENZOL SOLS	-	2 to 8

primary sections of the superheater and reheater was increased from 1" to 2". Spacing of the intermediate sections was increased proportionately.

#### **Fuel System**

The steam generator was designed for delayed coke, bituminous coal and refinery gas firing

with provisions for future firing with "Bunker C" oil. Of primary importance was the design of a system to handle the delayed coke which in appearance resembles slack coal.

Delayed coking is a process used to convert residual hydrocarbons to lighter, more valuable distillates and by-product petroleum coke. The reduced crude is heated rapidly and flows to isolated drums where it is coked by its own contained heat. The residual product which solidifies in these drums is known as "Delayed Coke." Hydraulic decoking is used to remove coke from the refinery drums. This consists of mechanical boring followed by impact cutting of the material with a high velocity rotary water jet. The coke

## PRINCIPAL EQUIPMENT — Yorktown Power Station, Virginia Electric & Power Co.

#### GENERAL DATA

Name of Station	
Station Site	
Total Generating Capacity150,000 kw	
Total Boiler Capacity1,200,000 lb/hr, 1800 psig, 100 F/1000 F.	00
Cooling Water SourceYork River	
Design & ConstructionStone & Webster Engineerin Corp.	g

#### GENERATING UNIT

Turbine
Generator One — General Electric, 175,455 kw at 30 psi hydrogen pressure, liquid cooled armature, 200,535 kva, 5263 amps, 22,000 v, 3 phase, direct con- nected
Main Exciter
Stator Coolers
Rotor Coolers
Oil Coolers
Oil FiltersOne — Bowser, 1080 gpm, 890 gal. cap.
Switchboard & ControlsGeneral Electric

#### CONDENSING EQUIPMENT

Condenser
Circulating Pumps
Condensate Pumps
Air Removal Equipment C. H. Wheeler, steam jet
Priming Ejectors
Expansion Joints

#### STEAM GENERATING EQUIPMENT

Boiler		One —	Combustion	Engineering,
	Inc., controlled	circulation, rad	ant reheat,	divided Inr-

nace, 59,700 sq ft heating surface (furnace), 1,200,000 lb/hr, 2000 psi at superheater outlet, steam drum 54" x 39"6", mud drum 36" x 49"6"
Superheater
Reheater One — Combustion Engineering, Inc., Elesco, 19,010 sq ft, total reheat temperature 1000 F
Furnace
Economizer
Steam Air Heaters
Air Heaters
Sost Blowers
Blow-off Valves
Water ColumnsOne — Diamond Bicolor. One — Yarway Clear
Safety Valves
Blow-off Tanks One - Missouri Iron Works
Boiler Control Panels Bailey Meter Co.

#### FUEL HANDLING, PREPARATION AND BURNING

Car Shake-Out
Automatic Scales
Conveyor ScalesOne - Builders Providence Inc.
Plate Feeders
Crushers One — Pennsgivania Crusher
Beit Conveyors
Pulverizing Mills
Feeders
Burners
Combustion Control Bailey Meter Co., pneumatic
Fuel Oil Pumps
bine Co.
Gas Pressure Regulators One — Fisher Governor Co., 35 psi reduction
Stack

is cut in layers and drops to a sump below the drums from where it is removed by a drag scraper to a dewatering pile.

After dewatering for a period of 48 hours, the delayed coke is transported by large earth-moving equipment to air drying piles in our fuel storage area. Here natural drainage and air drying reduces the moisture content from approximately 10% to 4% and less in a period of about seven days. It is then moved by our personnel from the air drying pile with bulldozers to the nearby coal and coke reclaiming hopper for delivery to the station bunker.

Coal is transported to the station by railroad, and the track facilities are arranged to handle 35 to 40 loaded cars. A car shakeout, provided to assist in the unloading operations, is located above the double element feeders from which the coal is delivered by two successive belt conveyors to the crusher house. The car shakeout is equipped with two speeds to reduce noise level. The coal is then delivered either to the station bunker or to the storage area.

A reclaim hopper located between the coal and coke storage piles takes coal or coke as delivered by bulldozers. A feeder takes either fuel on a conveyor belt which discharges to the crusher. From the crusher the coal or coke is conveyed to the station bunker by means of a single conveyor system capable of handling 500 tons per hour of coal, or 300 tons of coke per hour.

Due to the low volatile content of the coke, it was evident that stable ignition could not be maintained over normal load range without the use of a supplementary fuel. It was decided to blend the coke with a higher volatile bituminous coal in the pulverizers to supply a homogeneous mixture of medium volatile pulverized fuel. This is accomplished by storing coal and coke in a partitioned bunker having a capacity of 2500

The partitioned bunker is divided into four sections, with coke stored in the two outer sections and coal in the inner compartments. Coal and coke flows to separate scales and thence through turn feeders to the individual pulverizers. The four pulverizers are

Breech	ing
	Oraft FansTwo — Westinghouse (Sturtevant), 108,000 cfm each 100 F and 880 rpm, 600 hp, motor driven
Induce	d Draft Fans
Air Du	icts
	Gages
	ControlsOne — Balley Meter Co., pneu-

#### BOILER FEEDWATER EQUIPMENT

Boiler F	Feed Pumps		.Two -	Ingersoll-	Rand, 700,000
	lb/hr each,	5447 ft, vi	ariable spe	eed rated	at 3470 rpm
	motor driver	n with hyd	raulic cou	plings	

Point Capacity Ib/hr Tube Pr. Shell Pr.	pleaner Heat	Brs	ix - Griscom	-Hussell Co.
1 119 690 8175 580	Point	Capacity Ib/hr	Tube Pr.	Shell Pr.
1 110,040 3110 020	1	113,620	2175	520
2 43,450 2190 206	2	43,450	2190	206
4 51,420 240 47	4			47
5 50,540 240 10	5			10
6 22,670 240 8	6			- 8
7 39,710 540 1.2	7	39,710	240	3.2

Deaerating Heater ...... One — Worthington Corp., lo-cated at point 2. Tray type, direct contact, internal vent condenser, 1,002,000 lb/hr

Feedwater Regulator ..........Two — American Blower Co., variable speed fluid drives on feed pumps

Water Treating Plant ...... Graver Water Conditioning Co., 176 spm, automatic, two bed, degasifying, demineralizer. Major equipment includes: 2 activated carbon filters, 2 anion units, 2 cation units, 1 descrator, 1 caustic storage tank, 1 acid tank, 1 caustic measuring and mixing equipment, 1 acid measuring and mixing equipment, 2 acid measuring and mixing equipment. Equipped with automatic controls and meters

#### ASH HANDLING EQUIPMENT

Ash	Conveyors	United	Conveyor	Corp.,	pneu-
Ash	Bunker	United	Conveyor	Corp.	
Fly	Ash Collector	Wester	n Precip	itator	Corp.,

#### PIPING, VALVES, TRAPS

Piping Contractor	Grinnell Co.
Main Steam Line	Chrome-Moly Alloy Steel, 14.75"
Check Valves	Walworth Co. and Edward
Gate & Globe Valves	Crane Co. and Walworth Co.
Non-Return Valves	Ruggles-Klingemann Mfg. Co.
Reducing Valves	Fisher Governor Co.
Desuperheater	Copes-Vulcan Div., Blaw-Knox

Small Valves Manning, Maxwell & Moore, Inc.
Relief Valves Farris Engineering Co.
Chambers & Fleats Fisher Governor Co.
Traps Armstrong Machine Works
Drainers
Expansion Joints
Covering Contractor
Covering Material Ehret Magnesia Mfg. Co., Ther- molite magnesia and Thermolite calcium silicate

#### INSTRUMENTS

Flow Meters
Draft Gages
Pressure & Vacuum Gages Indicating: Manning, Maxwell, & Moore, Inc. Recording: Bailey Meter Co.
Mercury Cois. & Barometer Meriam Inst. Co.
Thermometers (Indicating) Manning, Maxwell, & Moore, Inc.
Thermometers (Recording) Bailey Meter Co. and Leeds & Northrup Co.
Condensate Conductivity  Recorder  Leeds & Northrup Co., multi- point, strip chart.
Master Pilot Steam Gage Bailey Meter Co.
CO, Recorders Leeds & Northrup Co.
Plant Water Meter

#### ELECTRICAL EQUIPMENT

Main Transformers Westinghouse Electric Corp.
Auxiliary Transformers Westinghouse Electric Corp.
Oil Circuit Breakers
Disconnect SwitchesFederal Pacific Co.
Storage Battery Electric Storage Battery Co., 60 cell
Motor Generator Sets Two — Westinghouse, 5 kw exciters for synchronous motors
Battery Charger One — The Electric Products Co., 10 kw, 140/129 volt generator

#### MISCELLANEOUS

Fire Pumps Two — Peerless Pump Co.
House Service Pumps Worthington Corp.
Air Compressors
Turbine Room Crane Whiting Corp., 60 ton
Vacuum Cleaning System Spencer Turbine Co.
Couplings for Meter Drives Koppers Co. (Fast's), Falk, Sier-Bath, Westinghouse
Water Tanks

slightly oversized in order that a high degree of fineness can be attained, and to permit handling the coke containing a small amount of residual oil.

The combustion control system is designed to maintain automatically the predetermined coal to coke feed. Weightometers and sampling systems are installed to maintain a complete record of the coal and coke handled by the station conveying system.

#### **Ash Handling System**

An impounded water type ash hopper with steel plate exterior and firebrick lining is installed under the boiler furnace. Ash from this hopper is jetted hydraulically to an ash dewatering tank having a capacity of 150 tons of ash. Water in the bottom ash is drained from the bin to an ash settling pond. Fly ash from the dust collector, the economizer outlet, the air preheater, and the stack hopper is removed by a vacuum system and stored in a 600-ton tile silo.

Ash is unloaded from the silos by means of a dustless unloader to trucks which haul it to ash disposal areas. Provisions were made for future shipments by railroad.

Water for the ash system is supplied by ash sluicing pumps which take their suction from the inlet circulating water lines.

Only multicyclone mechanical dust collectors are installed on this unit since it was questionable if an electrostatic precipitator would function effectively with the high carbon content of the fly ash expected to be produced. The collector is designed to remove 85% by weight of all suspended matter from 575,000 cfm of flue gas at a temperature of 300 F with a maximum draft loss of 3.0 in. water.

Space has been provided for a future electrostatic unit, and tests are presently being conducted to determine if material discharged from the mechanical collectors can be collected with reasonable efficiency electrostatically.

#### Feedwater System

The feedwater system consists of two vertical motor driven condensate pumps taking suction from the condenser hotwell and discharging through the inter and after condensers of the steam jet air removal equipment, the gland steam leakoff condenser, and the 7th, 6th, 5th, and 4th point closed feedwater heaters to the deaerating heater on the 3rd extraction point. By-passes around each of these closed feedwater heaters enables any heater to be removed from service.

All the heaters with the exception of the 7th and 6th point heaters have shut-off valves in the extraction steam lines from the turbine. Since the 6th and 7th point heaters are located in the condenser neck, shut-off valves could not be installed.

Water from the deaerating heater flows to two half-size motor driven feed pumps equipped with hydraulic couplings. The boiler

(Continued on page 72)

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Arkansas Chemical plant . . .

## Plastic Panels Resist Corrosive Atmosphere

THREE years ago a test installation of "Metal Grey" structural plastic panels manufactured by the Resolite Corporation, was made in the North Little Rock, Arkansas fertilizer plant of Olin Mathieson Chemical Corporation. The panels are a formulation of polyester resin, Fiberglas-reinforced, that is highly resistant to corrosion. They are dull metallic grey and opaque.

High concentrations of ammonia and sulphuric acid fumes above the fertilizer mixing units had necessitated regular replacement of the standard metal roofing and siding panels about every 2½ years. This was not only costly, but when replacement was necessary, production suffered.

Although the Resolite panels were higher in initial cost than metal panels, plant engineers figured that, if the plastic panels lasted twice as long as the metal, resulting savings in labor costs and lost production time would more than compensate for the extra initial expense.

C. H. Amaden, superintendent of the plant's maintenance and construction department, recently reported that the panels seem to be as good as when they were installed three years ago.



Installation of Resolite Metal Grey plastic panels and Resolite daylighting panels in the Olin Mathieson Arkansas plant. The chemical resistant panels are the shiny panels immediately opposite some severely corroded structural and corrugated panels.

EUTECTIC Welding News

PLANT, RESEARCH LABORATORIES and WORLD HEADQUARTERS

Published by EUTECTIC WELDING ALLOYS CORPORATION

## WHEN THESE SPOKES CRACKED THIS ROCK CRUSHER STOPPED



(Cast iron pully wheel, completely disrupted production... repaired in under 24 hours with XYRON 2-24.)

Five of the six spokes on this cast iron pully wheel cracked at the hub, completely shutting down a Northwestern rock crusher installation. Manufacture, delivery and installation of a new pully wheel would take over 3 weeks, with a resultant loss in production.

Company engineers agreed that spokes could be repaired if welding temperatures could be kept low, and preheating eliminated. They realized most failures in welding cast iron are attributable to high heat input and result in cracking.

The local "Eutectic" Technical Representative was called in and recommended Veeing out the cracks with Eutec ChamferTrode, then repair-ing them with Xyron 2-24 (AC-DC)... a "Low Temperature Welding Alloy."

"Eutectic" is the inventor and sole maufacturer of "Low Temperature Welding Alloys." Over 350 Technical Representatives from coast to coast are only a phone call away. They provide immediate consultation service and

practical advice on any job-anywhere. Eutec ChamferTrode (DC Straight) can chamfer or gouge out all metals without the use of oxygen. Its special exothermic coating concentrates the force of the arc right at the point of application. The arc blasts unwanted metal from its path, leaving an ideal

surface for subsequent operations. Xyron 2-24(AC-DC) is a patented cast iron electrode for "cold" arc welding, and is designed for repairing long cracks and defects. "Frigid Arc" coating

allows greater ease of application at lower amperages.

The lower welding amperages pos sible with Xyron 2-24(AC-DC), and its ability to do the job without preheating avoids cracking and embrittlement and encountered often with conventional high heat welding materials. All of this permitted the quick, inexpensive complete repair of the pully wheel with such speed that only one shift was lost. When the pully wheel was restored to service, it operated perfectly...well within operational tolerances.

### **EUTECROD 1600 PRODUCES** ROUND CLEAR NOTES

A world renowned manufacturer of brass wind instruments used this Eutectic "Low Temperature Welding Alloy"6 to solve a long standing problem. How to reduce the percentage of rejects caused by joint failures, distortion, pinholes, discoloration and visible blemishes . . . all due to high welding

temperatures.

A"Eutectic" Technical Representative recommended EutecRod 1600 be used to join component parts of clarinets, French horns, trumpets, trombones and saxophones. EutecRod 1600, a universal copper, brass and bronze alloy is an outstanding "brazing" type alloy; ideal for short, thin joints, far superior to conventional brazing alloys. Ultimate tensile strength: 55,000 psi. Since it does not require fusion of the surface of the base metal. EutecRod 1600 may be applied at very lowest temperatures.



The manufacturer now reports perfect color match and elimination of high heat warping, distortion and pinholing. Rejects have been drastically reduced, production costs cut.



Eutectic Warehouse -- Service Genters 446 Northside Drive, N. W., Atlanta 18, Ga. 2204 Irving Boulevard, Dallas 7, Texas

**Eutectic Welding Alloys Corporation** 40-40 172nd Street, Flushing 58, N.Y. Please send me free the

NEW 1958 180 PAGE POCKET WELDING DATA BOOK

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EUTECTIC WAREHOUSE-SERVICE CENTER · 446 NORTHSIDE DRIVE, N.W., ATLANTA 18, GA. **EUTECTIC WAREHOUSE—SERVICE CENTER · 2204 IRVING BOULEVARD, DALLAS 7, TEXAS** 

' WELDING HEADLINES-TIME-MONEY-MACHINERY SAVERS

## How to Find Weight per Cubic Foot

EVERY ONE doing technical or mechanical work occasionally runs up against the problem of finding the density, or weight per cubic foot of a granular material, such as nut and slack coal, ashes, etc. The writer has noticed that some operating engineers have gone to the trouble of having a cubic-foot box made up for this purpose, at some expense and trouble.

We offer the following simpler solution:

- Obtain an ordinary bucket.
   Wipe dry and clean. Weigh the empty bucket.
- (2) Fill the bucket with water and weigh it on scales. In order to avoid spilling water on scales, fill the bucket, level full with a dipper, after placing the nearly filled bucket on scales.
- (3) Find the weight of water in the bucket by deducting the weight determined under (1) from that obtained in (2).
- (4) Empty the water, wipe the bucket dry, fill the bucket level full of coal, or other material to be tested, and weigh the filled bucket.
- (5) Find the weight of the coal by deducting the weight of the bucket, as determined under (1).
- (6) Divide weight of coal (5) by the weight of water (3)\* and multiply this quotient by 62.4\*\*. This product gives the weight per cubic foot of the material.

Explanation: Dividing the weight of coal by the weight of an equal volume of water gives the specific gravity of coal. A cubic foot of water at temperatures between 40 and 55 F weighs very close to 62.4 pounds. Therefore, multiplying the specific gravity by 62.4 gives the weight of a cubic foot of coal.

Example: A bucket weighs 2.6 lbs, filled with water it weighs 23.4 lbs. The bucket is now filled with coal and weighed. Its weight is 17.02 lbs. What is the density of the coal?

$$\frac{17.02 - 2.6}{23.4 - 2.6} \times 62.4 = \frac{14.42}{20.8} \times 62.4 = \frac{20.8}{20.8}$$

The coal should not be packed or tamped, however in filling the container actual conditions should be simulated. If the actual bunker or hopper is filled by a conveyor the bucket might be placed in the falling coal stream, or else the coal might be dropped by a shovel from a similar height.

Several determinations should be made, and if non-uniform results are obtained, the average density should be taken.

By T. H. DUFFY (W. Va.)

Editor's Note: Use of a larger bucket than that indicated in the author's example would tend to give greater accuracy.

This method will give very accurate results for relatively noncompressible materials such as coal, gravel, etc. Care should be exercised, however, in using it to determine weight of such material as bark, logged fuel, etc., that have been compressed by long storage in large bins.

## Check-List for Explosion Hazards

A CHECK-LIST of 13 questions that can help you determine whether uncontrolled flammable gases, vapors, dusts, liquids and other combustible materials are making your plant unsafe are contained in a new 8-page, illustrated folder by Crouse Hinds Company.

Part of the folder is sealed until all the questions have been answered. After the seal is broken, an evaluation of the hazard potential in your plant is revealed, based on your answers and the findings of the National Fire Protection Association.

For your free copy write "Hazard Finder," Dept. HF, Crouse Hinds Company, Wolf & Seventh North Sts., Syracuse, New York.

### ULTRA-STRENGTH STEELS - Grades Available

signed to meet steadily increasing requirements for higher strengths and strength weight ratios, are growing rapidly in demand. Originally used almost exclusively for aircraft parts—landing gears and airborne equipment—these steels are now being considered for many other applications where their weight and space saving advantages more than offset their higher fabrication costs. The steels have yield strengths over 200,000 psi.

Some end uses where these advantages would pay off are: heavy machinery operating at high stresses; machinery where inertia is a design factor; cranes and other materials handling equipment; parts such as gears, pulleys, bolts, liners; portable tools; and transportation equipment.

A new 16-page booklet "Ultra-Strength Steels" published with the assistance of the American Iron and Steel Institute, the U. S. firms producing these steels, and several welding companies is available at no charge to SPI readers. Write Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.

Booklet describes in detail all of the grades available in the U. S. today.

# "it's a wonderful, trouble-free little steam trap"

- Q. Mr. Weaver,\* you have a lot of Yarway Impulse Steam Traps here at the Prior Tire Company plant. Why do you use Yarways and how do they perform?
- A. Yarways, for our money, are wonderful, trouble-free little steam traps. They do everything we ask of them and since the time they were installed in October 1956, they have performed perfectly.
- Q. Where do you use Yarways, chiefly?
- A. We have 31 Lodi Steam Tire Recapping and Vulcanizing Molds, and each is individually trapped with a Yarway.



"Each of our 31 Tire Recapping and Vulcanizing Molds is individually Yarway trapped."



"Yarway Traps do everything we ask of them."

- Q. Does this operation demand any special performance from a steam trap?
- A. Well, yes. In tire recapping there are three important elements—time, pressure and temperature. On two of them Yarway traps make a big contribution. They save time by bringing our molds up to operating temperatures fast. Then they maintain the hot, even temperatures necessary to keep our production at high level. The small size of the Yarway is an advantage, too, since it greatly simplifies our piping arrangement.

If you would like a copy of a new, helpful booklet, "The Why and How of Steam Trapping," drop a card to

YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave. Philadelphia 18, Pa. Southern Representative: ROGER A. MARTIN Bona Allen Bldg., Atlanta 3, Ga.

\*JACK WEAVER, Plant Manager, Prior Tire Company, Atlanta, Ga.



...a good way to
Apecify Ateam traps



OVER 1,200,000 YARWAY IMPULSE STEAM TRAPS ALREADY USED • STOCKED AND SOLD BY 275 CONVENIENT LOCAL INDUSTRIAL DISTRIBUTORS • NATION-WIDE YARWAY ENGINEERING STAFF AT YOUR SERVICE.

# **Announcing**

another outstanding development soon to be available by the makers of BUSS FUSES

# FUSETRON

LOW-PEAK

**FUSES** 

Have

**CURRENT LIMITING** 

added to

**High Interrupting Capacity** 

and

Long Time-Lag

#### Made in all standard sizes above 60 amperes

FUSETRON Low-Peak Fuses are made in all standard sizes above 60 amperes—both 250 and 600 volt ranges. In 60 amperes and smaller sizes tests show that FUSE-TRON dual-element fuses have sufficient current limitation to protect circuit and components in all normal cases.



These new FUSETRON Low-Peak Fuses are built on the same principle as FUSETRON dual-element Fuses. They have:

the same High Interrupting Capacity the same Time-Lag to hold harmless current surges

PLUS Greater Current Limitation to restrict fault currents to a LOW PEAK

FUSETRON Low-Peak Fuses can be interchanged with FUSETRON dual-element Fuses.

Where their use is required in any part of the

electrical system, they can be installed without upsetting proper coordination over the range of useful loads and normal faults.

Hence, their application requires no testing or complicated calculations.

They are designed for use to protect circuits and components that might be damaged by the thermal and mechanical stresses of peak fault currents if other protective devices are used.

If planning new installations, keep FUSE-TRON Low-Peak Fuses in mind for those locations where peak fault current must be held to a low value.

### BUSSMANN MFG. DIVISION

UNIVERSITY AT JEFFERSON, ST. LOUIS 7, MO.





CLEAN AIR, together with humidity and temperature control, is extremely important for satisfactory economical performance of sensitive automatic controls. Consequently, automation as it continues to grow in industry will bring new demands and new requirements for complete air conditioning. Perhaps no company is more skilled in applying controls than Southern Bell. Therefore, what they do today indicates what general industry will be doing tomorrow as automation becomes more general. Here is how correct automation environment is provided by ex-

## **Conditioned Air for Southern Bell**

THE MAGNITUDE and complexi-

ty of telephone communications in the mid-20th century all but staggers the imagination. One phone call may require operation of hundreds of electrical contacts. Multiply this by many thousands of local and long distance calls and some realization can be had of the daily operation of Southern Bell Telephone and Telegraph Company, Atlanta, Ga.

With the expansion of telephone facilities has come the introduction of extensive systems of intricate and delicate relays and switches which are in constant operation. The performance of these systems, similar to electronic computers or data-processing installations, may be seriously affected by high humidity and dust. To control these conditions and to improve working conditions in the area, year-round air

conditioning provides cooling and and dehumidification during hot weather and heating and humidification during cool weather. Air filtering and circulating equipment operates throughout the year.

Until 1947, ventilation of the Southern Bell Toll building in Atlanta, Georgia consisted of window and floor fans. When eight floors were added to the building's original six stories, ventilation ducts were included to meet existing needs. In 1950, when long distance dialing equipment which generates a great deal of heat in its operation was installed in the building, dehumidification was introduced as a safeguard for the equipment as well as to improve working conditions.

#### Refrigeration Units

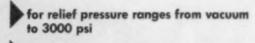
The most recent installation

is a complete central station air conditioning system using chilled water provided by two Hermetic Centrifugal Refrigeration machines (300 tons capacity each), manufactured by Carrier Corporation. The compact orderly looking machines operate with negligible vibration or noise. They are without heavy concrete bases, and occupy little space. The machines are of the hermetic or enclosed motor construction, whereby air and water vapor and refrigerant leakages are prevented. They are, nevertheless, arranged for easy service through convenient access covers.

The accompanying diagram shows how heat transfer takes place. Water in the tubes of the machine's cooler shell (prior to circulation to conditioning equipment), is chilled by transferring its heat to cold liquid refrigerant.

# back pressure control problem? CASH STANDARD

has the answer!

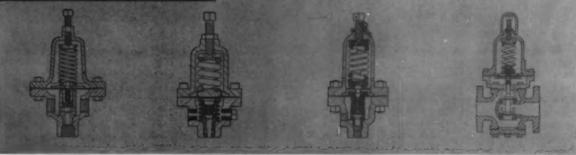


- available in iron, bronze, steel, stainless steel
- for almost all liquids and gases
- sizes from 1/4" to 4"
- self contained, direct operated units

Designed for any application where back pressure regulation is required. Also available in differential style to maintain differential pressure between fluids on both sides of the diaphragm.



one side inlet. Bottom connection is outlet. Screwed ends, sizes 1/4" to 2"; flanged ends.



#### TYPE BQ

Diaphragm Type Relief Valve Relief pressures to 250 psi, temperatures to 450°F. A small valve especially for jobs requiring accuracy with law volume af flow. Can be used as angle valve by plugging one side inlet. Scrawed ends, sizes ¼", ¾" and ½".

TYPE 6987

High Pressure Relief Valve Relief pressures to 1200 psi. Screwed ends, sizes ½" and ¾"; flanged ends, size ½".

## TYPE 2275 Angle Type High Pressure Relief Valve

Relief pressures to 3000 psi. Side inlet, bottom outlet. Screwed ends, sizes  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", 1" and  $1\frac{1}{2}$ ".

#### TYPE 8311

Pressure Relief Valve
Relief pressures to 500 psi. Packless, direct operated. Single or
double seat construction. Screwed
ends, sizes ½" to 3"; flanged
ends, sizes 1" to 4".

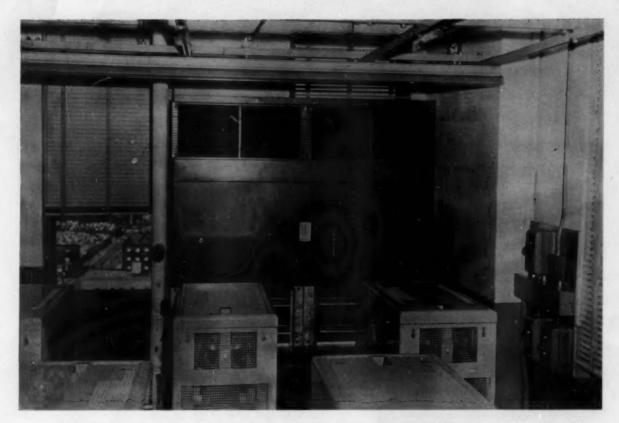
## What's your control problem?

Consult the Cash Standard control specialist in your area for an individual solution to your control problem or write to Dept. M.

## CASH STANDARD

A. W. Cash Co. and Its Subsidiary, Cash Standard Stacon Corp.
P. O. Box 551, Decatur, III.

Pressure, Hydraulic, Temperature, Pressus and Combustion Controls



Electronic toll translator equipment selects long distance phone routes by means of a photo electric cell. Units can release as high as 1000 watts of heat per hour per machine. Equipment is highly sensitive to changes in temperature and humidity. The air condition unit is at center.

By absorbing heat from the water, the refrigerant vaporizes and is drawn into the suction side of a 2-stage centrifugal compressor. The compressed gas is then discharged into the condenser shell under pressure and at a higher temperature than the water in the condensing tubes. Here the heat originally gathered up by the air conditioning equipment is transferred to the condenser water. The refrigerant reverts to a liquid state again and drains by gravity to the cooler below, where the cycle continues.

With a combined cooling capacity of 600 tons the two refrigeration machines have the ability to adjust automatically to cooling loads varying from 10% to 100% of capacity.

#### **Automatic Controls**

Electronic controls insure matching the machines' capacity to the

momentary load. This fact is of importance to the operation of a telephone equipment building. Some switching rooms are in operation 24 hours a day — in contrast with the business office areas, functioning 8-9 hours per day, 5 days a week. As can readily be seen, heat loads and corresponding cooling requirements of the entire building are of necessity in a constant state of change.

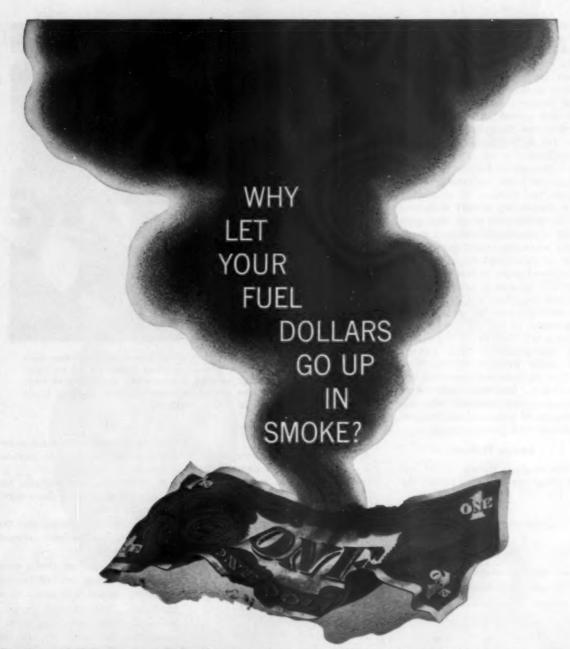
#### Example

As an example: portions of the building contain equipment for long distance transmission between cities. With the use of thousands of vacuum tubes, congested in several hundred square feet of space, heat up to 60 watts per square foot is encountered in some areas.

When the building's cooling requirements decrease — the refrigeration machines automatically throttle down. If the refrigeration load drops to a certain point one machine shuts off. When the number of telephone calls increase, with a corresponding increase in telephone switching equipment activity, the second machine starts automatically — producing cooling in accordance with demand.

#### Air Cooling Units

The water chilled by the refrigeration machines is pumped at the rate of 3200 gpm to 14 individual air handling units — one on each floor. Since every floor possesses different heat load characteristics, Newcomb and Boyd, Consulting Engineers, designed the system as if the 14 one story buildings were stacked one upon the other. Where areas of any one floor differ in air conditioning requirements, a multi-zone air handling unit is employed. These



## Packaged Ljungstrom® Preheaters increase efficiency for boilers as small as

25,000 lbs per hour! Money spent on fuel in a single year often equals the cost of the boiler itself! And with fuel prices continually rising, every BTU is doubly precious.

So don't let fuel dollars go up the stack—in smoke. Whether your boiler produces 25,000 or 250,000 pounds of steam per hour, the shopassembled Ljungstrom preheater recovers heat—and dollars. Results: FUEL CONSUMPTION IS REDUCED! Generally 10% or more. This will usually write off the cost of a Ljungstrom in less than 2 years.

BOILER PRODUCTION 15 INCREASED! By preheating air, higher temperatures in the furnace are assured, higher heat absorption and steam producing capacity are made possible.

LESS MAINTENANCE NEEDED! Improved combustion means less slag, cleaner stack gases. Thus you benefit from fewer overhauls; longer service between shutdowns.

LOW GRADE FUELS PRACTICAL! Higher furnace temperatures permit effective burning of very low grade fuels.

COMES READY TO INSTALL! The Ljungstrom is shop-assembled, is easily applied to your steam-gener-

ating units. For details, contact The Air Preheater Corporation today. Ask for our free brochure.



The Air Preheater Corporation, 60 EAST 42ND STREET, NEW YORK 17, N.Y.

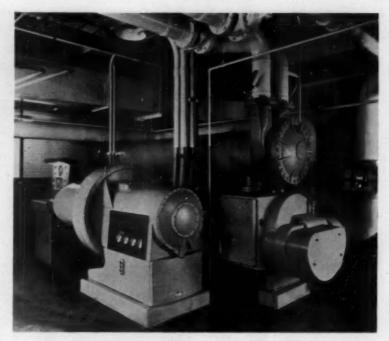
floors with uniform heat load are served by single zone units (see drawing).

In areas with switching equipment only, 10% outside air is drawn in through manually operated dampers, mixed with return air and passed through a bank of dry-type filters and then into the fan. (In heavily populated switchboard areas, 25% outside air is brought in for mixture with return air.) The fan blows the air across the surface of a cooling coil, containing chilled water.

The conditioned air is then supplied to rectangular shaped ductwork suspended from the ceiling. and is distributed to offices and equipment areas. It is desirable to prevent leakage of unconditioned air into the offices and spaces. This is accomplished by pressurizing the rooms, by forcing more air in than is returned to the apparatus for reconditioning. This surplus air under pressure of the fans causes an outward flow through doorways, windows and other leakages, and prevents the infiltration of untreated air through windows and door openings.

#### **Design Features**

The original design of the air handling system was guided by



Two Carrier hermetic centrifugal refrigeration machines with 300 tons capacity each, provide chilled water for 14 air handling units. Machines located in basement operate with negligible noise and can adjust automatically to cooling loads varying from 10% to 100% capacity.

two factors:

 The present 14 story building may eventually undergo additional construction, therefore no exterior surface was available for one huge air shaft — an obvious distribution method.

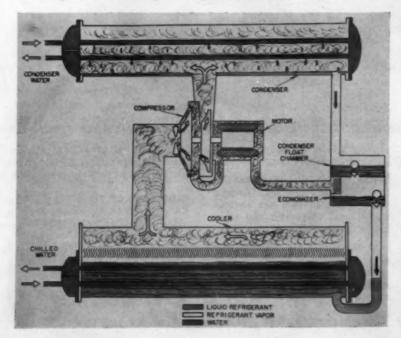
Space was not available for installation of vertical risers within the building.

The remaining solution was the use of individual air units on each of the 14 floors.

Existing ventilation shafts were also utilized and loss of crucial operating space was kept to a minimum. Interestingly enough, on some floors switching equipment rises to within 11" of the ceiling — restricting air ductwork to 8" in depth.

Telephone communications throughout the country have grown at a fantastic rate — and Southern Bell is certainly no exception. Founded in 1879, the company provides service to a nine state area from Kentucky south to Florida. A net addition of 462,000 telephone installations were made in 1956 and over 300 million dollars were invested in new telephone facilities alone. At present nearly 90% of Southern Bell's

Diagram of centrifugal refrigeration machine's operation.





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Revnolds Aluminum Supply Company's nine industrial metals warehouse facilities may well be the answer to your supply problems. Production delays from lack of metals or metal-working equipment pass when you depend on the extensive Reynolds Aluminum Supply Company life-lines. These metals warehouses, located in nine major Southern industrial cities, will feed metals of every description - aluminum, steel, copper, stainless steel - into your plant in any quantity when needed. Metal slitters, shears, decoilers, roll formers, corrugaters and plate saws are strategically located in several of these areas to provide you complete metals supply and service. And you can count on fast and accurate delivery. These dependable facilities offer a one-stop supply line that represents a vital life-line to industries throughout the South. For the life of your business, call Reynolds Aluminum Supply Company today!



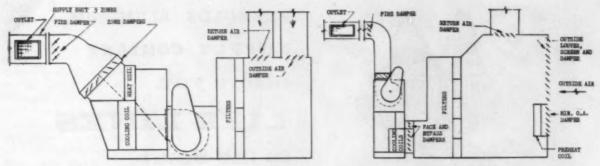


Diagram of zone air handling units. Equipment functions independently on each of 14 floors. Multi-zone unit is at left and single-zone unit at right.

phone service is dial operated.

With the tremendous growth in size and complexity of telephone systems, Southern Bell feels that year-round air conditioning is the economical approach — if opti-

mum equipment performance is to be obtained. As a result, dial circuit troubles have been greatly reduced; employee morale and efficiency have been raised; and building maintenance costs materially reduced.

The general contractor for the Southern Bell Toll building air conditioning installation was Barge-Thompson, Inc., Atlanta, Georgia.

## Good Battery Performance & Life

SMALL USERS of battery-power-

ed industrial trucks can get just as good battery performance and life as large users if they follow the example set by Wheeling Machine Products Company, Elm Grove, W. Va. Two 8,000 lb forklift trucks and two powerized hand trucks, move 1,500,000 pipe couplings and nipples weekly on three shifts in this modern plant employing about 450 people. Two batteries per truck permit 24 hour per day operation. Still going strong, two of the large 495 ampere-hour Gould batteries are in their ninth year of service.

Battery charging and maintenance is done in a small, compact, fully-enclosed battery room which is locked at all times except when batteries are being changed. The plant electrician is solely responsible for the battery charging and

Note compact enclosed charging room. Large battery in foreground being checked for specific gravity has automatic temperature control. Thermocouple inserted in electrolyte of one of the cells automatically shuts off generator if temperature rises above 110 F.

maintenance and follows a regular program of cleaning and flushing. An equalizing charge is given each battery once a month. Distilled water for replacing electrolyte lost by evaporation is always handy on a shelf, inside the battery room, high enough to permit gravity feed of the water. Cleaning is done by steam at the plant's power house at regular intervals.

A small hoist operating on a fixed monorail lifts batteries to and from the trucks. The spreader bar is of local design and construction and is an adaptation of a similar device developed for dipping containers of their own nipples and couplings in solutions.

Battery records are kept on a simple form attached to the battery-room wall.





Another CONDENSER designed and built by MARIND



In ever growing numbers, Marind Condenser installations are earning a well deserved reputation for efficient, dependable performance. Designed and built by thoroughly experienced engineering and manufacturing personnel, Marind

power equipment products enjoy a reputation for outstanding quality. We have in process of construction units to suit turbo generators to 156 megawatts, and are capable of processing steam surface condensers to any size.

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STEAM CONDENSERS AND AIR EJECTORS

for stationary power plants and marine service



Subox paints go far beyond the passive protection of inert paints. The chemically-active suboxide of lead in Subox paints actually works continuously to combat corrosion, as illustrated by these photomicrographs:



#### LEAD-SUBOXIDE PARTICLES

Lead-suboxide is a colloidal pigment which assures maximum penetration of a surface ... packs to form a dense, impervious film. Two coats of Subox usually give the coverage of three of other paints ... often, one coat of Subox is enough.



#### FIELD OF LEAD SOAPS

As soon as Subox is dry, lead-suboxide begins to react with the fatty acids of the vehicle to form insoluble lead soaps whose fibers bear metallic lead. These fibers intertwine to continuously build up a reinforcing film of protection.



#### FIBROUS STRUCTURE OF LEAD SOAPS

The fibrous film gradually strengthens and replaces the original vehicle film which otherwise would have become brittle and have largely lost its protective power and adhesion.

Subox paints are the only American paints made with leadsuboxide. They are economical to apply, endure for years and largely eliminate the need for scraping and repriming when repainting is required.

Write for the brochure "Subox Paints".



6 Fairmount Plant Hackensack, N. J.

# Production Upped with Power Wrench

A SOUTHERN paper mill wanted

to raise its woodchip production to feed its ten digesters and at the same time reduce the seven hour daily downtime needed to change the blades of its two Carthage 96" disc chippers.

In changing the blades, the operator used a hand wrench to loosen a total of 60 nuts on the pine pulp chipper (6 bolts on each of 10 blades); and a total of 90 nuts on the hardwood chipper, which has 9 bolts per blade. By this method downtime on the pine wood chipper was four hours daily — one hour each time the blades were changed. The hardwood chipper required three hours daily downtime.



By substituting an Ingersoll-Rand Size 538 Close Quarter Impactool for the hand wrench, the downtime on each wood chipper was cut in half. The Impactool fitted easily into the 12" clearance behind the pulp chipper discs. Keeping the chippers in production 3½ hours longer daily resulted in a wood chip production increase of 73,500 pounds daily.

## ON TEXAS TOWERS

Wallace Process Piping Co., Inc.



#### WELDING FITTINGS

Among the unique installations for preservation of peace are the early warning radar "Texas Towers" off the Atlantic Coast. These artificial islands stilted to the ocean floor keep watch by radar. As is true of many defense projects, Midwest Welding Fittings played a significant part on Texas Towers.

Midwest Welding Fittings are found on unusual and in critical as well as routine jobs because of exceptional quality maintained by rigid standards of manufacture. Quality control is always above and beyond code requirements.

Whatever the piping job, you will find it to your advantage to use Midwest Welding Fittings. The many benefits you get by specifying "Midwest" are shown in Catalog 54. Ask your distributor or write us for a copy.

#### MIDWEST PIPING COMPANY, INC.

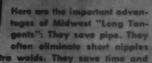
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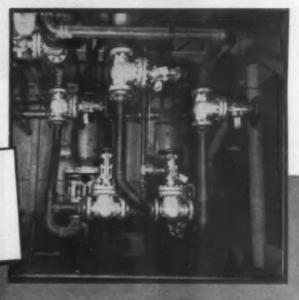
MIDWEST "LONG TANGENT" ELBOWS



and their extre welds. They save time and money in lining up and clamping pipe and fitting. They remove the circumferential weld from point of maximum stress and can be sleeved. Midwest "Long Tangent" Elbows cost no more than other elbows.

Piping on two Texas Towers was installed by Wallace Process Piping Co., Inc., as subcontractors to Steers Morrison Knudsen and Continental Copper & Steel Industries, Inc. All welding fittings were supplied by Midwest through Central Jersey Supply Co. The many advantages of Midwest "Long Tangent" Elbows were an important factor in the selection of Midwest fittings for this critical work.









# EYE-HYE

gives quick, accurate boiler water level reading for each drum at new automotive plant

Close-up of one of three panels shown below, in power plant of Chrysler Stamping Plant, Twinsburg, Obio.



Here, as in thousands of other plants, operators "keep tab" on boiler water levels easily, quickly — with EYE-HYE conveniently mounted on panel or wall where wanted.

EYE-HYE is simple, safe, sure — easy to read from its illuminated green indicating liquid. It is sensitive to slightest level changes. Has no mechanical parts — is completely hydrostatic. Set at factory for the boiler it's ordered for; no adjustments or tampering possible on location. EYE-HYEs are available for any boiler pressure.

As an extra precaution, if warning signals are wanted, EYE-HYE can be equipped to actuate auxiliary lights and/or horns in various parts of the plant.

There are many uses for EYE-HYE Remote Reading Gages. Besides the main boilers, it can do valuable service on feed water heaters, waste heat boilers, flash tanks, storage tanks, etc. When writing for information, mention your working steam pressure.

The Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland 3, Ohio



# Occupational Skin Diseases

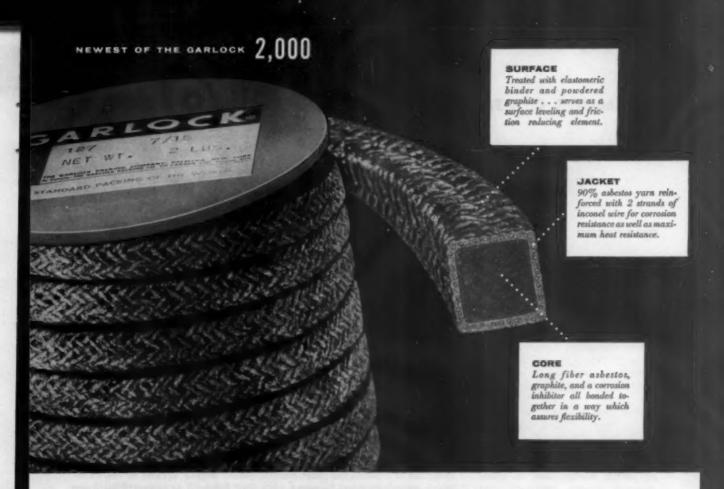
TWO-THIRDS of all occupational diseases are skin diseases, according to state compensation board reports. How to prevent many occupational skin diseases is revealed in an important booklet by Dr. Louis Schwartz — "The Prevention of Occupational Skin Diseases" — which is offered at no charge to SPI readers. For your free copy write: Huntington Laboratories, Inc., Huntington, Indiana.

#### **Cutter Cuts Costs**

A LOUISIANA shop which overhauls more than 2,200 electric motors and generators yearly found that stripping stator windings and cutting rusted bolts was a time consuming job with a hammer and chisel.



An Ingersoll-Rand Impacutter was put on the job; the power tool cuts through the wires so quickly that it is currently saving 462 man-hours annually. In terms of customer billing, this means a gain of over \$1,500 a year, roughly 18 times the cost of the tool. Other jobs for which it is used in the shop are the removal of ball bearing retaining nuts, knocking ball-bearings from their races, knocking out shaft pins, driving wedges, breaking spot welds, and cutting sheet metal.



## NEW valve stem packing...STYLE 127 for high pressure, high temperature Service

Here's an outstanding valve stem packing which is ideally suited to extreme steam conditions. Withstands pressures of 4000 psi., and steam temperatures to 1200°F. as long as stuffing box itself does not exceed 750°F. It is unsurpassed as a high temperature oil refinery or steam power plant packing.

This Style 127 Valve Stem Packing is the newest member of the Garlock 2,000 . . . two thousand different styles of packings, gaskets. and seals to meet all your needs. It's the only complete line. That's why you get unbiased recommendations from your Garlock representative. Call him . . . ask about the new Style 127.

#### OTHER GARLOCK VALVE STEM PACKINGS



Style 5855 - Similar to 127, but for lighter duty. Costs less, too.



Style 17—A braided asbestos yarn treated to resist steam at high pressures and temperatures to 600°F.



Style 117—A braided (or twisted) asbestos yarn treated for service against steam at low to medium temperatures.

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Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints, Fluorocarbon Products

# **Program for Nuclear Power**

THE CORPORATION known as

Carolinas Virginia Nuclear Power Associates, Inc., was formed October 4, 1956, by four power companies: Carolina Power & Light Company, Raleigh; Duke Power Company, Charlotte; Virginia Electric & Power Company, Richmond; and South Carolina Electric & Gas Company, Columbia.

Objectives of the corporation are to discover and study economic ways to produce and utilize nuclear material and atomic energy, primarily for the generation of usable energy, and to study, develop, design, fabricate, construct and operate one or more nuclear power reactors and any or all component parts, as a means to demonstrate the practical and economical use of nuclear energy for the generation of electric energy, together with such industrial and scientific products and by-products and applications as may seem desirable, all for the purpose of the advancement of scientific knowledge for the public good and national defense.

Officers of the corporation are: President — N. A. Cocke, president of Duke Power;

Executive Vice President — O. J. Miller, vice president and general manager of Duke Power:

Vice Presidents — L. V. Sutton, president of CP&L; E. H. Will, president of VEPCO; and S. C. McMeekin, president of SCE&G;

Secretary - Treasurer — J. M. Costello, executive vice president of SCE&G.

Board of Directors: N. A. Cocke, O. J. Miller, L. V. Sutton, H. B. Robinson of CP&L, S. C. Mc-Meekin, F. R. McMeekin, and T. Justin Moore of VEPCO, and E. H. Will

Steering Committee: O. J. Miller, H. B. Robinson, F. R. McMeekin and Miles Cary of VEPCO.

Technical Advisory Committee: E. C. Fiss, Duke; R. H. Kennedy of SCE&G; R. S. Talton, CP&L; and G. M. Tatum, VEPCO.

### **Development Program**

The program consists of four principal stages: (1) research and development of the pressure tube, heavy water moderated and cooled nuclear reactor plant; (2) construction of a prototype plant having a gross electrical capacity of 19,000 kw to verify the research and development program and furnish data for the evaluation of a future plant of 200,000 kw capacity or larger; (3) operation of the prototype plant with various core and component designs; and (4) possible construction in the future of a commercial nuclear power plant of 200,000 kw or larger by one or more of the member companies.

### Type of Reactor

The reactor is a pressure tube prototype, moderated and cooled with heavy water and fueled with approximately 2% enriched uranium. The developmental program will possibly use natural uranium, plutonium, and such other fuels as may prove appropriate.

The reactor's core will be located in an unpressurized moderator and reflector vessel having an inside diameter of 108 in. and an overall height of 132 in. There will be a total of 85 pressure tubes in the reactor. The fuel, in the form of uranium oxide pellets, will be contained in the core tubing.

Approximately 8,500 lb of uranium dioxide are required in the first reactor core. The AEC will supply the uranium in the form of uranium hexafluoride and this will be processed into uranium dioxide pellets, and loaded into the fuel tubes. Nineteen of these fuel tubes will make up the fuel assembly, and 170 fuel assemblies will be used in the prototype reactor.

At full power, 203,000 lb/hr of dry and saturated steam are produced in the steam generator. This steam will be delivered to the steam supply system of the existing plant to activate the turbines and generators. Existing switching gear and transformers will be used to direct the nuclear-produced electric power into the interconnected systems of the four member companies.

### Financing & Construction

The Atomic Energy Commission has been asked to bear pre-operational costs and post-construction research and development costs. The Associates will pay \$17,100,000 in costs of administration and coordination, conceptual design, program planning, engineering and design, construction, start-up and operation. The AEC is also asked to lend nuclear materials and heavy water.

June 30, 1962, has been set for the plant's completion, in order that it may be included in the AEC's third invitation for demonstration nuclear power projects.

Westinghouse Electric Corporation will develop the reactor itself. Stone and Webster Engineering Corporation will act as a consulting, design and construction supervision agent; and General Nuclear Engineering Corporation



### Specialists in treatments for the flue

Hundreds of installations have proved the extra efficiency of Buell Dust Collection Systems. In mechanical collectors, only Buell cyclones have the exclusive Shave-off that traps an extra percentage of dust, large-diameter design that eliminates bridging and clogging. In electrical collectors, only Buell "SF" precipitators have features like high-emission, failure-proof Spiralectrodes. The results are high collection efficiency, freedom from shut-downs, minimum or no maintenance year after year in every Buell installation. Get the full story in "The Collection and Recovery of Industrial Dusts."

Write Dept. 80-B, Buell Engineering Company, Inc., 123 William Street, New York 38, New York.









Experts at delivering Extra Efficiency in DUST COLLECTION SYSTEMS

SOUTHERN POWER & INDUSTRY for FEBRUARY, 1958

For more information, use Reply Card-Page 99

will provide consulting services required in connection with nuclear science and engineering problems.

The site for the proposed plant is approximately 25 miles northwest of Columbia, S. C., on the Broad River at Parr Shoals. The site was first developed by the Parr Shoals Power Company with the construction of a hydro-electric power station in 1914. The hydro-electric plant, and a steam plant which went into operation in 1925, are owned by South Carolina Electric & Gas Company.

#### Control

Supervision and control of the entire nuclear plant is to be accomplished from a single central control room. Instruments will give the operator complete information on the plant's performance. Radiation monitoring equipment will warn of plant malfunctioning.

The nuclear equipment will be installed in a 60 ft diameter vapor container about 110 ft high, with auxiliaries located in buildings outside the vapor container where safety requirements permit.

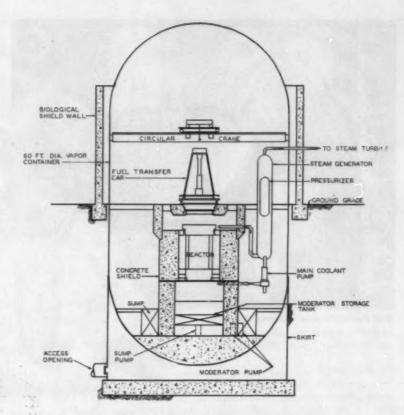
Radiation shielding, consisting mainly of concrete, is used as required to ensure safety of plant personnel.

The container will be partially buried in a hillside near the existing power station. A circular concrete shield wall will be constructed around the upper portion of the container, and supported on the fill made by the excavation for the lower half of the container.

The earth and biological shield wall will provide adequate shielding for personnel on the outside of the vapor container. Provisions are made for ventilation of the container, to purge air which might contain radioactive argon and tritium, before personnel access is permitted.

### **Waste Disposal**

Means will be devised for collection and disposal of liquid and gaseous waste from the reactor plant to assure maximum safety. A system of automatic detection and warning devices will be incorporated in the plant, leaving



**How Carolinas Virginia Reactor Will Work** 

THE VITAL PARTS of the reactor to be used in the Parr Shoals atomic power plant being developed by the Carolinas Virginia Nuclear Power Associates, Inc.

Fissionable U-235 is lowered into the reactor chamber where it is bombarded with neutrons. The process releases energy which in turn creates heat. The heat is absorbed by a heavy water coolant, and is directed to the heat exchanger where it boils water. The resultant steam is directed to the pressurizer and steam generator, and then to the steam turbine of the existing Parr steam plant.

little room for human error in its operation. All personnel will wear individual detection devices, and permanent health records of all plant employees will be kept.

### Design & Construction

The Associates presented a proposal to the Atomic Energy Commission on August 23, 1957, outlining its plans for the reactor and plant.

If approval is given by AEC by the first of 1958, detailed design, The reactor core is surrounded by control rods which absorb neutrons and act to control the fissioning process. Safety features include the heavy shield walls surrounding the dome-like vapor container, the thick steel walls of the container itself, and the heavy concrete shields surrounding the reactor. The bottom section of the vapor container will extend some 55 feet underground.

The fuel transfer car will be controlled from outside the container, as another safety measure. Automatic detection and warning devices will be used throughout the installation.

on both the reactor and the plant, will get underway immediately. Purchase of materials will follow in approximately one year.

Actual construction of the plant is tentatively scheduled to begin about the first of 1960, with 2½ years allowed for completion of plant, and completion and installation of the reactor.

Meanwhile, further studies will be made, and findings will be incorporated in the plant and reactor designs.



Rock Hill, South Carolina . . .

## **Mobile Equipment Electric Powered**

BATTERY-POWERED lift trucks and jacks perform efficiently under contrasting conditions and meet a variety of materials handling needs at the Celriver plant

of Celanese Corporation of Ameri-

ca, Rock Hill, S. C.

In the above photo of the textile and staple area of the plant, three types of handling are illustrated. At the left an electric jack is being used to lift, as one unit, a beam which has been placed in its rack. In the center an electric truck equipped with forks is stacking packaged goods. At the right the same type of truck equipped with a "beam racker" is carrying an individual beam.

The fork trucks are powered with Exide Types TH-15 or TH-13 Iron-

clad batteries and the electric jacks with 12-volt Exide batteries. Average trip is from 200 to 300 yards. Loads are about 1,500 lb and include a variety of materials and supplies. Batteries give full shift service before recharging. Average battery life is almost seven years.

In another location, four electric trucks equipped with clamps are used to unload and store heavy rolls of wood pulp. Later the trucks move the rolls to the production line. Runs are short but the duty is heavy. Average trip is 50 to 75 ft. Loads weigh from 1,000 to 2,000 lb. The constant lifting, hauling, revolving, stacking and quick return for another load places a heavy drain on the batteries.

Celanese keeps the trucks in this unusually rugged service operating at peak efficiency throughout the work day by using a booster charge during the noon lunch hour and between shifts.

The company selected batterypowered equipment for use in this location in its Celriver plant to safeguard against damaging raw material by leaking oil, to avoid exhaust fume pollution in enclosed areas, and to minimize fire hazard from sparks.

Celanese found the answer to the rough service conditions imposed on the trucks by powering them with Exide Type TH-15 Ironclad batteries made by Exide Industrial Division of The Electric Storage Battery Company.

### Vepco's Yorktown Station — Contd.

feed discharge line is a single line from the pump discharge header to the 2nd point heater where the flow is divided into two lines. After passing through the two 2nd point heaters and two 1st point heaters, the two lines rejoin into a common line to the economizer.

Study of the arrangement of the two high pressure heaters showed considerable savings could be obtained by paralleling the two 2nd and two 1st point heaters. However, for the 2nd unit, it will be more economical to have single full sized heaters.

Based on previous experience, it was decided that only two half-size boiler feed pumps would be installed; each capable of pumping 700,000 lb per hour of condensate against a TDH of 5447 ft. With the increased reliability of boiler feed pumps, we could not justify the additional expenditure required for a spare pump.

### **Water Treatment**

The water treatment equipment consists of two demineralizing units which treat city water as supplied by The Newport News Water Works Commission. It is capable of producing a net output of 115,200 gallons per day of high quality demineralized water for boiler feed make-up.

The demineralizer consists of two activated carbon filters for removing organic matters; two cation units which remove positive ions; a vacuum deaerator which removes CO<sub>2</sub>, O<sub>2</sub>, and other gases from the water; two anion units which remove negative ions, and the necessary regenerative equipment, tanks, and controls to complete the system.

The demineralized water from the anion exchange units is delivered to a 65,000 gallon storage tank for boiler feed make-up. Make-up water from this storage tank is introduced into the condenser by vacuum as required by the system.

Acid and caustic wastes from the cation and anion units during regeneration discharge to a waste neutralizing tank where controlled mixing is obtained before disposal to the ash settling basin.

### Turbine - Generator

The 150,000 kw, TCTF, 3600 rpm ASME-AIEE Preferred Standard turbine is designed for steam at 1800 psi and 1000/1000 F reheat and to exhaust at 1.5 inches Hg abs. Steam is extracted at seven points for feedwater heating and for steam air heaters. Blades in the last row are 23 inches long. When operating at a net station output of 172,045 kw, steam entering throttle at 5% overpressure, and 1.5 inches Hg abs back pressure, the turbine heat rate is 7830 Btu per kwh.

The generator is a three-phase, 60 cycle, 22,000 volt, 3600 rpm unit rated 200,535 kva at 30 psi hydrogen pressure and 220,589 kva at 45 psi hydrogen pressure, both at .85 power factor.

The generator rotor is hydrogen cooled with recirculation by fans on the rotor. Surface type coolers on the generator cool the gas. The hydrogen storage system is external to the station and is designed for the addition of future units. The generator (third such unit in this country) has liquid-cooled armature windings. A pump located in the fluid circuit external to the generator circulates the cooling liquid (Transil oil) through the copper conductors to an external heat exchanger.

The main exciter is driven by a 1450 hp, 4160 v motor and is rated 1000 kw at 375 v and 720 rpm. Base excitation voltage is controlled by a motor operated rheostat and an amplidyne voltage regulator located in the exciter field circuit.

A spare motor-generator exciter rated 1000 kw at 375 v and 885 rpm is installed and will serve as a spare on future units installed at this station.

### **Condenser System**

The unit is served by an 80,000 sq ft single pass surface condenser, designed to condense 780,000 pounds of steam per hour and to cool 140,000 pounds of external

drips per hour and maintain a vacuum of 2.4° Hg abs with 100,-000 gpm of 80 F river water having a salinity range of 11.4 to 27.2 parts per thousand.

Tubes of % inch 18 BWG 90-10 Cu-Ni material are used, having a length of 29 ft 9 in. The water boxes are divided to permit counter-flow through each section. The vertical partition in the water boxes has a 48" butterfly valve connecting the two sections. With this valve and the necessary valves installed in the inlet and discharge lines, water can be recirculated to the forebay in order to raise the water temperature to permit temperature shock for control of marine growth in the large concrete inlet conduit.

A 10,000 gallon deaerating hotwell, high and low level control, and steam air ejector equipment are provided. Wet vacuum pumps are employed for maintaining vacuum on the circulating water system in order to reduce pumping power requirements.

### Circulating Water

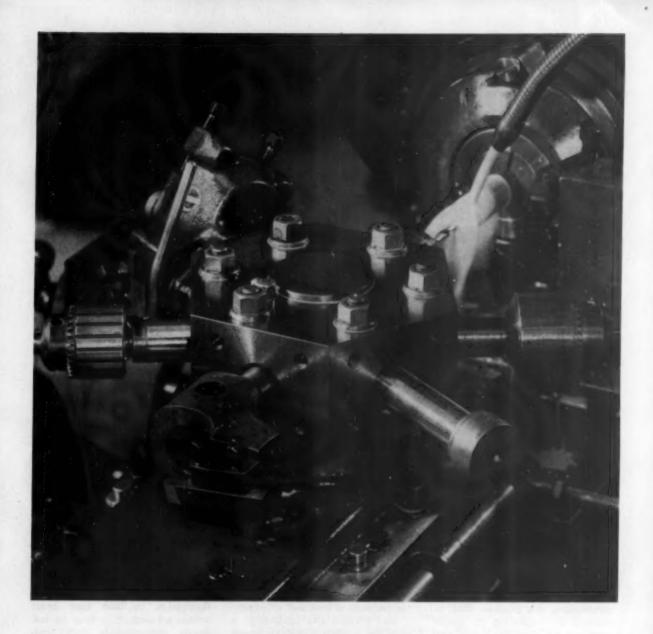
The circulating water intake system consists of a dredged channel extending 2400 ft from shore to the deep channel of the York River and an excavated channel 500 ft long extending from the shore line to the screenwell structure. The first 1100 ft from the shore line is protected from storm damage by creosoted wooden sides and pilings.

The channel is sized for supplying the needs of four units, 570,000 gpm, and 250,000 gpm for Amoco's requirements. Water from the two vertical single stage pumps discharges into two 60" concrete lines running to the condenser which were required for the back washing practices previously mentioned

A single 84" concrete line from the condenser discharges the circulating water into a sealed pit at the entrance to the excavated discharge channel which extends 1700 ft to the river. The channel is sized to meet the requirements of four units.

### **Cooling Water**

A recirculating cooling water (Continued on page 76)



### The Drops that Up Production!

In cutting oils it's the quality each drop delivers, not the quantity used, that ups production. Backed by the largest combined petroleum research and testing facilities in the world Standard Oil Cutting Oils are designed and refined to help secure improved finish and closer tolerances while giving tools a cushion against shock and a protection against wear in cutting,

drilling, reaming and tapping operations.

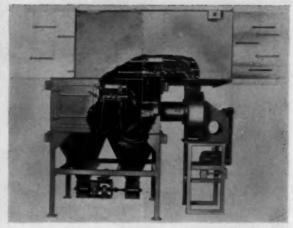
The cooling effect of these oils is brought to a level that makes high speed work possible without machine damage. Rigid controls in-

sure that every drop of Standard Oil Cutting Oils contains a full measure of these characteristics.



STANDARD OIL COMPANY (Kentucky)





Boilers were operating when this photograph of the twin fly-ash collector at Memphis Works was taken. Diagram shows how the collector works.

Memphis Plant Eliminates Fly-Ash Problem

# Clean Stacks Make Good Neighbors

THREE YEARS ago, the International Harvester Plant at Memphis, Tennessee made a decision to eliminate fly-ash discharge from its boiler stacks. It spent a considerable sum of money in accomplishing this purpose. But, in addition to improving its public relations, the Memphis Works also decreased plant maintenance costs.

Built on the outskirts of the city, the plant at first had no serious air pollution problem. But when new residential neighborhoods began to spring up around it, there were more and more complaints about smoke and soot from the powerhouse stacks.

The production schedule was heavy. Unless something were done, soot and fly-ash would continue to rain down on the new neighbors. Management at Memphis Works has always tried to maintain good public relations, so the decision was made at once to curb the fly-ash nuisance.

The first step was to make a complete investigation of available boiler fly - ash collection equipment. The company installed smoke indicators, tested control equipment, and made detailed comparisons of cost and efficiency. It also planted and landscaped a beautiful sixteen-acre park to act as a buffer zone between the plant and the residential section. During this time, nearby homeowners were given periodic progress reports.

The powerhouse at Memphis Works employs two Springfield boilers with water-wall sides and back, and over-fire air jets. Each boiler has a capacity of 63,500 lb/hr, at 525 hp, 300% rating. Each is equipped with a LaClede chain grate stoker. Fuel is egg-size Kentucky western coal crushed to minus one inch. Heat value averages 11,500 Btu per pound and ash content varies from 5.9% to 9.3%. With boiler efficiency at

73%, stack gases range from 50,-000 to 120,000 cfm at 450 F to 600 F, with an average  $CO_2$  content of 8.7%.

Since steam is used for both heating and processing, a 30% fluctuation in load may occur within a twenty-four hour period. Steam requirements vary from 20,000 lb/hr during the summer to 110,000 lb/hr during peak winter operation. Such varying conditions make it mandatory that any fly-ash collector installed be able to retain its efficiency over a wide range of exhaust volumes.

After tests and investigations were completed, Memphis Works-selected a high-efficiency, dry centrifugal collector manufactured by the American Air Filter Co., Louisville, Ky., known as Amerclone. This collector has good abrasion-resistant qualities, and its high collection efficiency remains practically constant over a wide range

(Continued on next page)

### JEFFREY Collectors remove mill scale...greatly lengthen life of rolling mill bearings



Jeffrey mill scale collectors at Pollak Steel Company, Marion, Obio.

Eighty-five tons of scale and grease removed in six months! That's the remarkable record these Jeffrey collectors have established...putting nearly 3 million gallons of process water back to work daily at this rolling mill.

Bearing life on their rolling mill has been increased enormously, according to the plant's operating men. There's no abrasive scale in the water to cause excessive wear on bearings.

Jeffrey sanitation engineers will help solve your water conservation or sewage treatment problems—a complete system or individual units. The Jeffrey Manufacturing Company, 898 North Fourth Street, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY ...CONTRACT MANUFACTURING



### (Fly-Ash Collection)

of exhaust volumes, without need for damper control.

The principle of operation of the collector is shown in the accompanying diagram. Air entering the inlet plenum flows tangentially through the primary (Type G) tubes. Ten per cent of the gas stream, along with concentrated fly-ash, is thrown into the primary hopper. Approximately 50% of the material settles in this primary, or decantation, hopper. The remaining fly-ash, along with the secondary air circuit, is drawn through concentrator (Type A) tubes. Collected material is deposited in the concentrator dust hopper. Cleaned gas from the concentrator is blown back into the inlet plenum by the secondary fan.

	Primary Hopper	Secondary Hopper
Material collected, lb/hr	30.0	30.6
Combustible content		24.1%
Absolute density	1.94	2.2
Particle Size		
0- 5 microns	0.9%	3.0%
5-10 microns	0.9%	6.0%
10-20 microns	2.2%	13.0%
20-30 microns	3.0%	5.0%
30-40 microns		7.0%
+44 microns		66.0%

Performance of the collectors at various boiler loads is as follows: 25% load — 89.0%, 50% load — 86.5%, 100% load — 92.6%. Efficiency with the soot blowers operating is 89%.

Tests were performed on one of the collectors to determine the particle size and combustible content of material collected in the hoppers. The accompanying table shows results with the boiler operating at half load.

The \$71,900 fly-ash collection system at Memphis Works has eliminated smoke and soot. Community relations have never been better.

### Yorktown Station

(Starts page 44)

piping system supplies the cooling water for the bearings, turbine oil coolers, station oil coolers, hydrogen coolers, air compressors, and other equipment coolers. This system consists of two motor driven pumps, storage tank, and three tubular heat exchangers. The pump discharges through coolers, giving up heat to the river water, which is supplied by the main circulating water pump. The make-up to this system is obtained from the condensate pumps' discharge header.

#### Controls

The controls for two units are centralized in a central control room in order to reduce station personnel. The combustion control, steam temperature control, drum water level control, and air heater controls are all of the Bailey Mini-Line type located on a bench board. Full sized recorders and indicators are located on the vertical gauge board. All major equipment is completely controlled from this control point. Standard interlocks, and protective devices are

incorporated in the design of this unit.

### **Electrical System**

The output of the unit is delivered to the 110 kv switchyard through a 220,000 kva step-up transformer bank consisting of two 110,000 kva, 3-Phase, FOA transformers connected in parallel. The 110 kv switchyard provides six circuits, two each to the Peninsula area and the Chesterfield Power Station, and two to 110-13.8 kv transformers feeding the Amoco refinery.

The entire substation, except for the generator breakers, is arranged for fully automatic operation, and only indication of circuit breaker position and amperes on one phase of each circuit is indicated in the centralized control room.

A 12,000 kva, 3-Phase, OA (future FOA) transformer provides station service power at 4160 v. A 12,000 kva, 3-Phase OA (Future FOA) transformer connected to the 110 kv switchyard bus provides reserve station power. One 4160 volt switchboard and two 480 volt unit substations are provided. Motors of more than 150 hp are operated at 4160 volts. Motors of 150 hp and smaller operate at 440 volts.

### **Water Symposium**

Proceedings of the Sixth Annual Water Symposium, held at Louisiana State University are available at \$1.75 per copy. Write for Engineering Experiment Station Bulletin No. 59, Louisiana State University, Baton Rouge 3, La.

WATER supply and water pollution controls of past years and present efforts as well as future planning for development of water resources were discussed by a group of leaders in these fields.

Discussions reprinted in Bulletin No. 59 include: Water Usage Practices in the Southern Kraft Industry, National Water Pollution Control Through Cooperative Effort, Industry and the Mississippi River, Future Water Resources, The Water Supply and Water Pollution Program of the Robert A. Taft Sanitary Engineering Center, A Rational Program for Stream Pollution Control, and Waste Disposal in the Sulphur Mining Industry.

### USE SPI READER SERVICE

See Pages 99-100

Crane helps another valve user stop high replacement costs



### How they solved valve failure on air service

This case history from Willamette Iron & Steel Co., Portland, Ore., shows how you can cut compressed air handling costs in your own plant.

These Crane packless diaphragm valves are handling 100 psi. air on manifolds to distribution lines used aboard ship during construction. Before installing the Crane ¾-inch No. 1610 valves, the yard was troubled by constantly rising maintenance costs. With the other make valves, diaphragms were rupturing after a short time, requiring continual replace-

ment. Loss of air and air power for equipment was costly.

Crane packless diaphragm valves were installed because their neoprene diaphragm functions only as a bonnet seal, and is not subjected to crushing and wear when used as a seating member. The maintenance problem was effectively solved, as it is for so many users throughout industry, by installing the right Crane valve. Contact your Crane Representative today—ask him for complete information on any application.



ASK FOR Crane Folder AD-1942 on packiess diaphragm valves. Contact your Crane Representative for a copy, or write to Crane Co., at address below.

### CRANE VALVES & FITTINGS

Since 1855-Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas



Light ceiling and floor not only improve illumination, but also aid in cleanliness. The work tables are painted in light tones, further adding to eye-comfort.

# GOOD LIGHTING a Tool for Production

PART 6 — Paint and Illumination

ORDINARILY when considering

lighting in the plant, we think of lamps and fixtures. It's easy to forget that the resulting illumination is to a great extent dependent upon the color of the walls and ceiling. Part II of this series pointed out that the color of the walls and ceiling should be taken into consideration when planning a lighting system. Obviously when light strikes a surface which is painted a light tone, more light is reflected than when it strikes a dark surface.

The reflectance values of various colors is usually called "reflection factor." If we measure the By ROY A. PALMER Duke Power Company Charlotte, North Carolina

light striking a wall and then measure the amount reflected from the wall, the reflection factor of the surface can be obtained. For example, if 100 units of light strike a wall which reflects 75 units the reflection factor is .75 or 75%.

Since reflection factors have such an important bearing in designing illumination, it is easily understood that a lighting system for a room with dark walls and ceiling will require more lamps and fixtures to produce a definite level of illumination than a room finished in light tones. Thus, selecting proper colors of paint will save initial investment in lighting equipment and result in lower operating and maintenance costs.

The importance of paint in lighting is demonstrated by the fact that in many cases the illumination has so depreciated because of accumulation of dirt and dust on walls and ceilings that when the room is repainted, the illumination is raised 100% over the depreciated level.

There is another angle in seeing on the part of the worker that

# C-V NEWS NOTES





# New regulator valve delivers on more jobs

Designed for remote control service, the Copes-Vulcan diaphragm actuated valve handles water, steam, air, gas, oil and other similar fluids with new efficiency. This valve has been engineered and precision-built for those operations requiring superior accuracy and sure dependability.

The Type-CV-D Valve may be direct or reverse acting. It has excellent rangeability and serves a broad variety of applications in sizes up to 12 inch.

Optional features include: cooling fins and stuffing-box lubricator to maintain low friction over longer packing life . . . auto-lock . . . top or side-mounted hand wheel for emergency operation.

To assure trouble-free performance, Copes-Vulcan customdesigns each valve to suit your most exact control requirements. Write for Bulletin 1027.



# Desuperheater developed to increase control

Based on a new steam-assist principle, this Copes-Vulcan Desuperheater permits close control of final steam temperature for processing work or auxiliaries. Using assisting steam only on lighter loads, it decreases the amount as the load increases. Exclusive swirl-chamber intimately mixes cooling water with steam. Inline type also available, Write for Bulletin 1024.

# On-the-job report on boiler control

How Copes-Vulcan helps make more power for Carolina Power and Light Company is covered in this factual report on the Louis V. Sutton plant. Highlights include: Combustion, feed water, boiler feed pump re-circulation controls plus automatic-sequential soot blowing. Write for Bulletin 1032.





### **COPES-VULCAN DIVISION**

BLAW-KNOX COMPANY ERIE 4, PENNSYLVANIA



Ceilings and walls are painted flat white in this paper mill. Lighting units are 400-watt color improved mercury lamps in Holophane prismatic glass reflectors.

is usually unnoticed. In dark surroundings, the great majority of the light comes to the work directly from the fixtures since very little light is reflected from surrounding surfaces. In such cases material or products being manufactured having bright surfaces such as polished aluminum, chromium plating, stainless steel, etc., create uncontrolled reflections that can be very annoying. This not only hinders the workers' seeing to the extent that hazards are invited, but production is slowed down and more seconds result. Light reflected from light colored walls and ceilings will help to relieve the sharpness of specular

This situation should not be confused with the use of specular reflection from bright surfaces to determine checks, flaws, or undesirable wavy areas. In such cases, a special lighting unit of proper size is placed purposely to provide this specular reflection at a definite angle, while general illumination of a high level protects against severe contrast.

### Floors Should Be Light

While floor areas in many plants are partially covered by machines or other equipment, the exposed areas are usually sufficient in size to warrant painting a light color. This is especially true in plants where fine work is done or where overall good appearance is important. Light floors help to maintain cleanliness. Dark floors might not show dirt and dust - but they are there nevertheless - to perhaps mar manufactured product and invite accidents. Light floors have a marked effect in boosting the illumination.

### Glossy vs Flat Paints

Generally, flat or mat-finish paint should be used. While it is usually thought that glossy paints reflect more light, actually



a flat paint will have equally high reflection factor. Glossy paint will provide a specular reflection from lamps or windows which probably gives rise to the belief that it reflects more light. Because of these "hot spot" reflections, glossy paint is less desirable since the overall appearance of the room is not attractive with these "hot spots" from windows and other light sources.

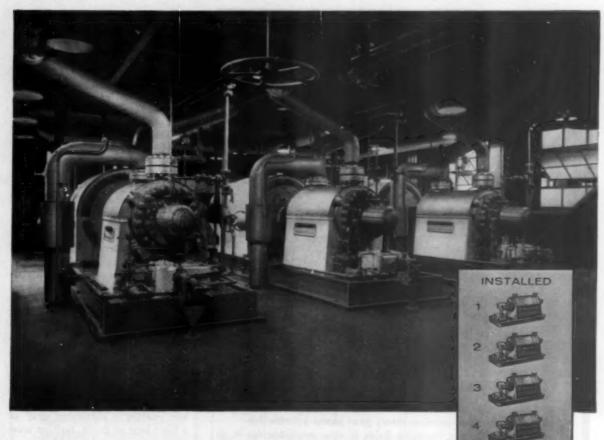
Actually, glossy paints have a slightly lower reflection factor than flat paints. This is explained by the absorption of some of the light as it passes through the glossy coat covering the particles of pigment. The light is reflected by the particles of pigment held in suspension by this transparent coating, so it actually passes through the coating twice, first on entering the coating and then returning after being reflected. The coating is usually somewhat yellowish in color, absorbing a small

percentage of the light. In flat paints, the light reaches the reflecting particles immediately and is reflected without loss in any intervening medium.

Glossy paint is given credit for keeping clean longer than flat paint. It is true that glossy paint will not become smudgy from soiled hands and objects rubbing against it as quickly as flat paint. However, on upper walls and ceilings out of reach from these deterrents, flat paint will not accumulate more dirt than will glossy paint. Therefore, glossy paints can be used to advantage along lower walls where, in addition to the relative immunity from soiling, the surfaces are at such an angle that light striking them will not cause annoying or appearancemarring specular reflections.

### Color Has Advantages

It is a well-known fact that we are emotionally responsive to our



# INDUSTRY'S FIRST CHOICE

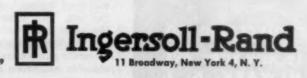
for high-pressure boiler-feed service

THE three Ingersoll-Rand 8-stage CHTA boiler-feed pumps shown above are installed in a large southwestern industrial power plant—each unit handling 1150 gpm at 3775 ft discharge head. Three other 8-stage CHTA units are installed in the same plant, and six more are now on order.

Each of these 12 units is another vote of confidence in the performance and dependability of CHTA pumps. In case after case, repeat orders from satisfied users make them the most widely used pumps for high-pressure boiler-feed service in the 1000 to 6500 psi range.

The Unit-Type Rotor Assembly—a distinctive I-R feature—contributes to high sustained efficiency, maximum strength, easy maintenance and widest possible interchangeability of parts throughout the entire CHTA line. The many unique features and advantages of these advanced-design pumps are fully illustrated and described in Bulletin No. 7211.

Whenever you have a high-pressure boiler-feed problem, your Ingersoll-Rand representative will welcome the opportunity to help you work out the problem to your best advantage.



ALL FOR THIS ONE POWER PLANT

COMPRESSORS . GAS & DIESEL ENGINES . PUMPS . AIR & ELECTRIC TOOLS . CONDENSERS . VACUUM EQUIPMENT . ROCK DRILLS



# FOR NON-LUBRICATING AND CORROSIVE FLUIDS

You asked for it ...

and Eco is the only manufacturer who has made it available. The first self-priming rotary gear pump suitable for non-lubricating and corrosive fluids is now available for immediate delivery. The pump, with ¾" P.T. inlet and outlet ports, features housings of 316 or Carpenter 20 stainless steel, Hastelloy C or nickel, with reinforced Teffon gears and internal Teffon bearings and packing.

Designated the GearChem, this pump is suitable for speeds to 1750 rpm at capacities to 10 gpm and pressures to 100 psi. Viscous media to 5000 SSU can be pumped at reduced speeds.

The GearChem created tremendous interest at the recent Chemical Show. In addition to proportioning and metering applications the pump is ideal for general process work in pilot plant and production operations.

Write for prices and complete information.

\* T.M. Applied For

Teflen-duPont trademark

Ke big hame in small pumps

MArket 4-6565

ENGINEERING CO. 12 NEW YORK AVE. NEWARK, N. J. surroundings. Out-of-doors, we have the blue sky, green trees and grass, bright flowers and various colors of earth. These colors lend to the beauty of the outdoors and lessen the visual task on the eye.

The average industrial plant has much dark machinery and walls and ceiling far removed from color or color contrasts that could contribute to a more pleasant atmosphere and create a happier attitude on the part of the workers. In such drab surroundings, even good lighting has a difficult time contributing more than ordinary seeing conditions. Experience in hundreds of plants has shown that a judicious use of color has improved the seeing, increased the comfort, and heightened the morale of the employees.

Many plants have found that painting the machines a light color adds materially to the appearance of the room and improves seeing conditions. This is not to suggest a rampant use of garish colors. This may confuse rather than improve the situation. If machines are painted a battleship gray or a light tone of green, buff, or blue, with the same color used for machines throughout the room, the resulting effect will be pleasing. Of course, it may not be practical to paint some of the working parts, but most machines have enough paintable area to make a good showing.

In some instances, it may be found advantageous to paint in a light tone, or even white, on the immediate area around the point on the machine where the worker concentrates his seeing. This will reflect a maximum amount of light on the working area. Contrasting colors surrounding this painted area may provide a three-dimensional effect which may help in eliminating safety hazards and in some cases assist in speeding up activity.

Painted machines, particularly the part around the working area, will need frequent cleaning or repainting. This is important since the value from both the lighting and psychological viewpoint is lost when the painted area becomes too soiled to maintain a good reflection

(Continued on page 104)

# Proven by performance!

All departments agree on operating efficiency of SARCO Thermostatic Steam Trap

- 1. Same head and seat for 0-300 psi - no changing of heads and seats for varying loads and pressures.
- 2. Fewer parts to stock same bellows, head and seat for 0-300 psi.
- 3. Greatest capacity per dollar cost-1" size discharges 9,650 lbs/hr at 10°F below steam temperature, 125 psi.
- 4. Very compact and light 34" size fits in palm of the hand. Weighs only 3% lbs.
- 5. Freeze-proof-wide open, selfdraining when cold.
- 6. Only one working part the thermostatic element. Can be inspected or replaced in few minutes without moving trap from line.

MAINTENANCE	PURCHASING	STORES	
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### SARCO

Balanced Pressure

### THERMOSTATIC STEAM TRAP

Same seat and head for all pressures to 300 psi Sizes 1/2" to 2" Write for Bulletin 250

Only Sarco Makes All 5 Types

... that's why Sarco can give

impartial advice on trap selection

# Proven by testing!

Steam-tested - every single Sarco Thermostatic is steam-tested at rated maximum pressure.

Proven "on-the-job" performance - maximum fatigue-resistance for every thermostatic element is assured by Sarco's exclusive helical corrugating process and fatigue testing method.

Quality Control - every step of manufacture under exacting tests and controls . . . in Sarco's own plant.

## Proven by experience!

During past 40 years, over 1,000,000 Sarco Thermostatics have been installed in countries throughout the world!

Sarco Company, Inc., 635 Madison Ave., New York 22, N. Y.

AN AFFILIATE OF SARCOTHERM CONTROLS, INC.

9919.B



Expansion Steam Traps

Thermodynamic Steam Traps

Fleat-Thermostatic Steam Traps



Camlift Bucket Steam Traps

STEAM TRAPS . TEMPERATURE CONTROLLERS . STRAINERS . HEATING SPECIALTIES

Thermostatic Steam Traps

### **Better Piping**

TRENDS today in many paper mills have been toward the use of better materials in piping. This trend has been primarily toward the various stainless steel grades. Many times management cannot see the added cost but it usually pays off. With this trend there must be a means of buying it which is fairly simple, a rough estimate of the tonnage involved, price determined by one method or another, and then finally the signal to go ahead.

This signal is the one that spells work, time and planning. There is no short cut so let's face the problem this way. A prefabricated stainless steel job fits the picture best so a full plan is the first must. There really is not a definite

time when this starts for the reason that in someone's engineering head there is already 25% to 50% of the plan. This can suffice as a good starter. From here on there should be only one view in mind; that is for the engineering staff to proceed in one direction and complete this set of plans. A plan of each floor involved in the building under construction must be made, with at least one elevation and additional elevations or sections, if needed for clarity.

### **Get Detailed Sheets**

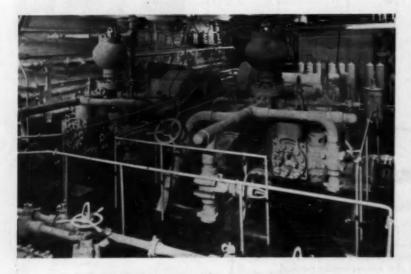
The next step is one where many a headache may be reduced to a slight pain. Select a fabricator who is a little more ambitious than some, who will supply you with a set of detail sheets. These need not be fancy, needing only to involve a single line as to how the contour of the pipe as an individual piece will look in the end. The advantage is that these detail sheets can be made up on 8½ x 11 in. sheets, whereas most plans are designed on 24 x 36 in. sheets.

While making for ease of handling, the smaller sheets can be combined in a book and used both during construction and after completion for filing. Time will be saved by a number of people who might handle this fabricated piping during erection of a pipe job. Most fabricators will make up these sheets for their own use. They are made up fairly easily as most of the data necessary is printed on the detail sheet in an abreviated form.

Double checking today is one of those lost, strayed or stolen arts that has been replaced by a haphazard single check system. Here is an excellent scheme for getting this double check performed without the chief engineer realizing the procedure. Consider that two parties are concerned; one the fabricator and the other the buyer. One does not trust the other so in exchange of design sheets and detail sheets, both are checked. Result: one double check. Next, the detail sheets are sent to the buyer who checks them off to see that the fabricator understands the design sheets. If at this point the buyer decides on a small change, here is a golden opportunity. Change it the way you desire, return it to the fabricator and on double checking, he notes the changes and acknowledges the same.

During this whole time one other advantage is attained. In order not to hold up the fabricator, particularly on his shop work, a good many straight lengths or single pieces can be released. This will also keep the buyer working on the designing end because the fabricator will be needing additional releases in order for him to stay on your contract. Then late in the contract if any of the pieces have been overlooked, both yourself as a buyer and he as a fabricator will give the final double check and the job will be 100% completed without any additions.

By WILLIAM ARCHIBALD, Heleno, Ark.



### **Grating Provides Safe Walking**

PRACTICAL use of open steel grating walkways around Gardner-Denver power pumps on a marine drilling tender off the Gulf Coast is illustrated.

Because of its continuous spiral transverse bars that rise slightly above bearing bars (and alternate right and left) this Weldforged grating, manufactured by Kerrigan Iron Works, Inc., provides excellent safety underfoot in hazardous areas around machinery, and where workmen must make re-

pairs in confined areas.

This open steel flooring also sheds dust, oil and grease, lets through a maximum amount of light and air and requires practically no maintenance. It is simple to install, as it is Weldforged into one-piece units with cut-outs for pipes and columns. In addition to the growing use of steel grating, aluminum spark-proof and stainless steel grating are now being used where extreme corrosion conditions prevail.



Walworth offers four lines of Bronze Globe Valves with stainless steel, plug-type seats and discs. Advantages of these valves include:

- Stoinless Steel Plug-Type Seats and Discs, heat-treated to a minimum of 500 Brinell hardness reduces wiredrawing to a minimum. Seats and Discs are machined and fitted simultaneously, assuring perfect mating.
- Deep Stuffing Boxes with Glonds are fitted with reinforced, molded packing. Valves can be repacked under pressure when fully opened.

For Longer Bronze Valve Life . . .

### "500 BRINELL" PLUG-TYPE STAINLESS STEEL SEATS AND DISCS

150 lb. 200 lb. 300 lb. 350 lb.

- Oversize Stems, made of high tensile strength siliconbronze, assure long life.
- Rugged Body Hexes, are flat on top; do not interfere with wrench gripping body-to-bonnet union ring connection.
- Bodies, made of Composition M bronze (ASTM B61), have ample wall thickness to provide high safety factor.
- Patented Handwheels are air-cooled and designed with a "finger-fit grip." Makes turning easy even when wearing greasy gloves.
- Identification Plates secured by lock-washer under stem nut, show Figure Number of valves and make re-ordering sure and easy.

FOR COMPLETE INFORMATION, SEE YOUR WALWORTH DISTRIBUTOR OR WRITE FOR ILLUSTRATED CIRCULAR

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SUBSIDIARIES: CITY ALLOY STEEL PRODUCTS CO. CONOFLOW CORPORATION MM & H VALVE & FITTINGS CO.

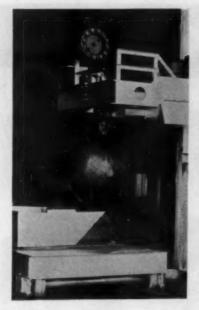
SW SOUTHWEST FABRICATING & WELDING CO., INC. WALWORTH COMPANY OF CANADA, LTD.

### Welding on a Track

NOVEL SETUP for automatic submerged arc welding of tanks and pressure vessels, in wide demand throughout the Southwest (particularly as the result of the Suez Canal emergency), is this gantry arrangement at the plant of Creamer & Dunlap, Inc., Tulsa, Oklahoma.

Devised originally by R. L. "Bob" Looney of The Lincoln Electric Company, it is unusual in that the work is moved and rotated under the welding head for both longitudinal and roundabout seams.

The vessel or tank is carried on a self-propelled car, with precision travel speeds controlled by motor voltage regulators, and also incorporating powered turning rolls. The entire welding head frame, with electrode reel, flux dispensing hoppers, etc., can be



raised or lowered electrically to accommodate different diameters of vessels.

With the aid of the 200 ft of trackage, it is possible to weld a

vessel on long seams and roundabouts on the outside from 24 in. diameter, % in. wall, up to and including 10 ft 6 in. diameter and 2% in. wall.

The 200 ft trackage was laid with instruments to limits of, plus or minus, % in. It is solidly held in concrete and will hold, without moving, loads of 100 tons or more. The longest unit ever welded on this setup was 135 ft — a petroleum fractionating tower of 1% in. wall.

Travel speeds on the welding head range from 12 to 18 in. per minute, typical of automatic submerged arc welding operations. Flux recovery systems get the nod in the Southwest where the volume of such welding is appreciable.

### Castable Refractory Lessens Downtime

AN ARKANSAS aluminum plant

has recently begun using a new 3400 F, high alumina castable refractory as a lining for the discharge chute of an alumina kiln. The chute is at the hot end of the kiln used for calcining alumina, operating at high temperatures.

Formerly, the kiln chute had been lined with pre-fired brick refractories. The brick could not withstand the punishment given them by the alumina nor did they have the necessary strength. Consequently, the chute lining was continuously being repaired.

The new castable refractory was recommended to the aluminum company for the lining of the chute because the product embodied those characteristics primarily necessary to take the abuse given to the chute lining. The castable refractory has outstanding strength at high temperatures, and is made from a very pure clay blend; elements in the clay make the castable especially resistant to abrasion.

Since aluminum is abrasive, it seemed logical to assume that the castable refractory could absorb the beating that must be taken by the refractory lining of the

### Replacement Tubes



# BOILER TUBE COMPANY OF AMERICA

BOILER TUBE Bidg., McKEES ROCKS. PA. (Pittsburgh District)

chute. Another benefit of the castable material was because of its easy handling qualities, it could save considerable installation labor costs.

The use of the castable refractory as a lining for the kiln chute has proved a definite improvement. The initial installation took little time in comparison to the old, slow method of laying brick. After considerable use, the lining shows no sign of needing repair. All this has added up to a tidy sum saved, both in labor cost and the costly time wasted for chute repairs when the kiln was not in operation. The castable refractory is withstanding the abuse of the abrasive attack of the alumina. The downtime of the kiln has been greatly lessened. The castable lining has been so successful that the aluminum company now plans to re-line additional chutes with the same material. The product employed is Purotab. It is manufactured by Mexico Refractories Company.

### THE PUBLISHERS of SOUTHERN

Power & Industry are cooperating with University Microfilms to make microfilm rolls containing the year's issues of the magazine available to general, special or company libraries.

Sales are restricted to those subscribing to SPI and the microfilm roll is only sold to purchasers at the end of the volume year. The microfilm copy is a positive, furnished on labeled metal reels.

Under the University Microfilms plan, the entire annual volume of a publication is provided in a single roll of microfilm, in editions of thirty or more. Under this plan libraries circulate their printed copies of the magazine unbound for the two or three years which usually is the period of greatest use. The printed magazines are then scrapped and their place is taken by the microfilm roll, which requires minimum shelf room. Cost of the microfilm roll is approximately equal to the cost of binding the same issues in regular library binding.

For further information write: University Microfilms, 313 N. First St., Ann Arbor, Michigan.



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Nothing protects iron and steel from rust better than zinc. And nothing applies zinc better than hot-dip galvanizing.

Our modern equipment assures small, tight spangles...smooth, uniformly heavy coats of zinc...no burrs or fins! A tough, long-lasting barrier against rust and corrosion.

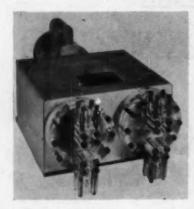
Call, write or wire for prices and information.

# ONE OF THE SOUTH'S LARGEST HOT-DIP GALVANIZING TANKS



P.O. Box 1714 . ATLANTA 1, GEORGIA . TRinity 5-3441

## **NEW Product Briefs**



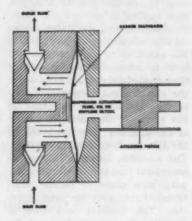
### Pump Handles Corrosive Fluids

The new Kemlon Pump is a diaphram-type unit specifically designed to handle corrosive fluids. Available from The Keystone Engineering Company. Box 14366, Houston 21, Texas, in both simplex and duplex models,

these pumps feature suction lifts up to 20 ft, with standard design pressures of 50 psi and much higher pressures available for special applications.

Unlike most "diaphram" pumps, the Kemlon Pump is essentially a piston type. It differs from piston type pumps only in having a barrier diaphram separating all of the working parts from the fluid handled. Where ordinary diaphram pumps depend on the force exerted by the diaphram itself to do the pumping, the Kemlon Pump employs an actuating fluid between the piston and the diaphram, without mechanical linkage of any kind to cause excessive maintenance or failure. The result is a smooth, hydraulically balanced piston action with equal pressure on either side of the diaphram barrier.

All surfaces of the pump which contact corrosive media are of solid fluoro-carbons. These materials, commonly called Kel-F or Teflon, have excellent chemical resistance. The heads and valves are not just coated but are molded solidly in plastic bonded to the back-up plates, which give strength to the plastic and prevent "creep" at high temperatures. This steel amoring of the plastic components overcomes the objectionable fragility of many non-ferrous designs.



All pumps are equipped with NEMA standard type C end mounted motors, which are available in explosion proof as well as other conventional types. Since it is a positive displacement type, the Kemlon Pump can be used either for metering single solutions or as a mixing-and-metering pump in the duplex design.



### Magnetic Gage for Liquid Levels

B-2 ordinary gages with glass, gaskets and threads cannot be tolerated due to dangerous inflammable or explosive conditions, Jerguson Gage & Valve Company. 80 Adams St., Burlington, Mass., have developed a new Magnetic Gage.

Scale is a series of edge-magnetized wafers which are attracted to each other to give a continuous scale. One side of the wafers is red, the other silver. Changes in liquid level operate a special float which in turn magnetically turns over the wafers. Liquid level is accurately shown on the scale in a continuous red band contrasted with silver above.

Gages are built to order and are offered for pressures to 2500 lb—600 F.

### Protective Spray Coating for Bulk Material Piles

A new spray has been developed by The Johnson-March Corporation. Phildelphia 3, Pa., which blankets and effectively protects outdoor storage piles of bulk materials against all types of weather conditions for periods up to a year or more.

The product, called Permaspray, is a colloidal suspension in water of a special chemical which forms a tough, flexible, water-resistant film when exposed to air and hardened. It is suitable for coating stock piles of coal, ores, coke breeze, flyash, sulphur, sand, paint pigments, waste, etc.

The deposited film is said to resist the action of wind, rain, frost and heat. It also stops dust nuisance and prevents windage loss. By stretching and deforming in heat and cold the film remains unbroken.

Permaspray is non-toxic, noncorrosive, and without adverse effect on the burning qualities of coal.

The solution is supplied ready for spraying in 55-gallon steel drums, and applied at the rate of one gallon of spray to 100 square feet of surface. This mixture is said to provide effective protection for one or more years. The solution is priced at approximately 65 cents per gallon f.o.b. Philadelphia.

### For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 99



#### Roll-On Roofing

A new type of "roll-on"

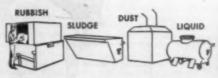
B-4 corrugated steel roofing
and siding called "Cecoroll" gives a weather-tight seal with
a minimum of labor, according to
Ceco Steel Products Corporation,
5601 W. 26th St., Chicago 50, Ill.
It is being used for roofing and

"CONTAINERIZE"
Waste As It Accumulates



# Dempster-Dumpster System Provides Temporary Storage at Points of Waste Accumulation

Enclosed temporary storage of waste is the key to plant cleanliness and low-cost disposal. Clean Dempster-Dumpster Containers, placed at major inside and outside waste accumulation points, perform this vital function. Costly rehandling is eliminated; one man and one truck-mounted Dempster-Dumpster dispose of all waste from your plant . . picking up, hauling and dumping containers on a planned shuttle schedule. This low-investment System generally pays for itself in 18 months or less.



WRITE TODAY for your free copy of the new manual, "How to Cut Industrial Waste Disposal Casts."

Dept. SP-2 DEMPSTER BROTHERS, Knoxville 17, Tenn.

# PARTIAL LIST OF USERS

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### New Product Briefs (Continued)

siding on factories, warehouses, garages, machine shops and storage

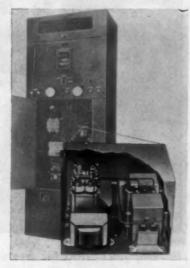
Because of Cecoroll's flat crimped nailing edges, it is not necessary to match corrugations and it is easier to start nails. Cecoroll is rolled on just as a rug is laid down. The edges of the 31-foot rolls are sealed with a factory-applied mastic lapsealer. The rolls come in 30" and

Application of Cecoroll takes 25% less time than with ordinary roofing. according to the manufacturer. Less framing is required, fewer nails are used, and no solid sheathing is necessary. The final installed cost is approximately the same as for ordinary corrugated sheet steel.

### No Tubes or Relays in New **Automatic Precipit. Control**

713-7

The new "Transistomatic" **B-5** automatic precipitator control, developed by Western Precipitation Corporation, 1000 West Ninth St., Los Angeles 54, California, has no tubes, no relays and no counters. It occupies very little space in the control panel (see photo rear).



The Cottrell Precipitator recovers

dust by passing it thru an electrostatic field. Since the efficiency of the process is dependent upon placing the maximum possible voltage on the gas stream short of "flashover," it is essential that this voltage be continuously adjusted to the fluctuating characteristics of the gas stream.

The new Transistomatic Control unit requires no maintenance, no parts replacement and uses only "allstatic" components. Unit is completely sealed in electronic potting compound so that it is unaffected by moisture, dust, humidity, etc.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page



### Temperature & Pressure **Transmitter**

A new, compactly design-B-6 ed temperature and pressure transmitter has been announced by Mason-Neilan, Nahatan St., Norwood, Mass. Designated Series 4600 for temperature and Series 4700 for pressure, these transmitters are pneumatic force-balance devices employing gas filled thermal systems for temperature measurement and bellows elements for pres-

One feature is said to be their "balanced beam" design which permits mounting of the transmitter in any position without positional error.

Unit sub-assembly construction is used throughout, permitting removal of sub-assemblies without disturbing beam assembly. Thermal systems and pressure elements are readily removed for change of range span. A derivative unit, which compensates for lags in the thermal system, can be quickly added on the underside of the baseplate, and requires no tubing or fittings. There is also a special provision for an integral Receiver Gage to be mounted directly on the baseplate without external connections.

### Safe, Floor Level **OPERATION** with a Babbitt Adjustable SPROCKET RIM with Chain Guide Simplifies pipe layout · Fits any size valve wheel · Easy to install and operate · Operates any valve from plant floor Time and money saving fixture · No maintenance; first cost only cost

· Packed, completely assembled, one to a

· Easy to follow instructions with each unit

Your supplier carries complete stocks

Babbilt



STEAM SPECIALTY CO

for all sizes

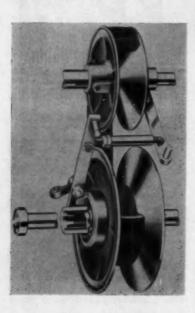
prices

### **Variable Speed Drive**

B-7 control, a new line of mechanical variable speed drives has been announced by Sterling Electric Motors. Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

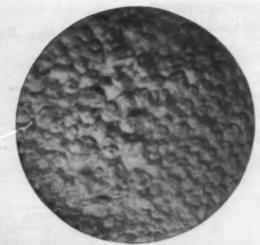
The units augment the present range of Sterling Speed-Trols to provide infinitely variable speeds from 4600 to 1.2 rpm in speed variations of 2:1 to 10:1.

These design "W" Speed-Trols are similar to Sterling's design "F," accomplishing speed variation by means of a special ribbed "V" belt and dual variable pitch pulleys mounted on parallel shafts. Movement of the pulleys is synchronized by Sterling's "Positive Pulley Control" which can be readily adapted to manual, semi-automatic or automatic controls.



New units are available in two basic constructions: Integral motor construction where the motor is mounted as an integral part of the case, and in separate motor construction where the motor is mounted on a separate platform and directly coupled to the variable speed transmission.

All modification, electrical or mechanical available on standard motors can also be supplied on Speed-Trols such as special frequency, voltage, shafts, face mounting, flange mounting, high torque, high slip, etc. Most Sterling Speed-Trols can be mounted in any position; floor, wall, or ceiling, horizontal or vertical without modification.

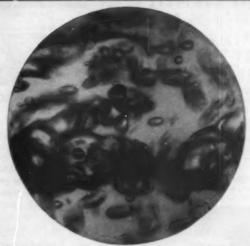


BEFORE CONCENTROL-Foaming of highly alkaline solution in glass test cylinder.

HERE'S PROOF:

### CONCENTROL

CONTROLS FOAM AND BOILER WATER CARRY-OVER



AFTER CONCINTROL-Same solution after addition of 12 ppm of Concentral Antifoam.

Where boiler water carry-over is caused by foaming due to high alkalinity and high proportion of dissolved solids in the water, Concentrol provides a low cost, effective method of chemical treatment and control. Supplied in liquid, powder or briquet form—to be fed continuously or in slugs to boilers—Concentrol is essentially a surface agent that causes breakdown of bubble film to prevent foam formation. Formulations of Concentrol can include organic sludge conditioning agents and other water treatment chemicals for boiler treatment as well as antifoam. Fast acting and resistant to hydrolysis or breakdown under normal boiler temperatures and pressures. Eliminates need for costly pre-treatment of water and high blow-down rate.

Write for NAME OF BIRD-ARCHER WATER TREATMENT ENGINEER NEAREST YOU.

BA 607





### TWENTY-FIVE COMPLETE SETS OF FLEXCO HD BELT FASTENERS NOW AVAILABLE IN ONE EASY-TO-HANDLE ECONOMY BULK PACKAGE

There's no need now to carry several 10-set boxes to the job—every "25-PAK" contains 25 complete sets of FLEXCO Fasteners (bottom plates, top plates, clips, nuts and bolts) . . . enough FLEXCO Fasteners to join common belt widths (for example; one "25-PAK" box, size 1½E, will join a 36" belt.) Our savings from bulk-packaging are passed on to you!

Label on each "25-PAK" box has chart indicating the number of FLEXCO HD Fasteners to use for given belt widths.



Standard shipping carton contains four "25-PAK" boxes of one size fastener. Keep a supply of "25-PAKS" on hand. Easy to store and inventory, sturdy boxes and shipping cartons have many uses.

Ask year FLEXCO distributor or write to us for additional information.

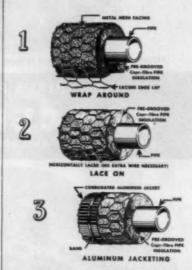


4045 LEXINGTON ST. . CHICAGO 44, ILL.

### New Product Briefs (Continued)

### Lace-On Pipe Covering

A new segmental laced-on pipe covering insulation has been developed by 48 Insulations, Inc. of Aurora, Illinois. The new product, called Copribre Lace-On Pipe Covering, is a felted mineral insulation which gives a one piece application at minimum first in-place cost.



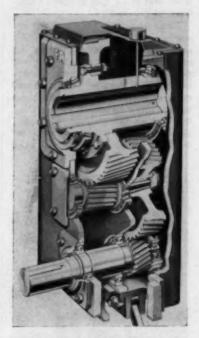
It is reinforced with a metal mesh facing which is horizontally laced together around the pipe, requiring no extra wire. The insulation is pre-grooved on the inside surface which allows an easy wrap and a tight fit around the pipe. After application, Copr-fibre Lace-On can be jacketed with aluminum or galvanized sheet metal for exterior application.

Temperature range for which Lace-On is recommended is from 100 to 1200 F. Thicknesses available are: 1" thru 5½". Copr-fibre Lace-On is applicable to 2" to 14" and larger sizes of pipe. K Factor is .26 at 100 F. It is chemically neutral, moisture resistant, stable, incombustible, and it will not cause or accelerate corrosion.

### **Shaft Mounted Drive**

B-9 shaft mounted drive—the 315J—is being produced by The Falk Corporation, 3001 West Canal St., Milwaukee 1, Wisconsin.

The all steel drive is available in single reduction ratio of 5:1 and in two double reduction ratios of 14:1 or 25:1. Unit ratings range from 2 hp at 5 rpm to 50 hp at 359 rpm; maximum torque rating at low speed shaft is 31,000 lb-in.



A longer center distance between shafts permits use of larger sheaves on installations where unit is mounted with input shaft toward driven machine or on through-shaft applications. Inspection covers on the 3-wall one-piece all steel housing provide easy inspection of bearings and helical gears. An automotive type dip stick is provided for a quick check of oil level.

Detailed information, including selection and dimension tables, is given in Bulletin 7100.

Fer More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 99

### **Ohmmeter**

B-10

A new Megger low resistance ohmmeter, by the James G. Biddle Co., 1316

Arch St., Philadelphia 7, Pa., is completely self-contained and battery or rectifier-operated.

The direct reading instrument for field and bench use measures accurately down to 10 microhms, has 4 ranges, an open 34" scale, and weighs only 10 lb.



Unit has wide application in electrical maintenance — resistance measurements of electrical conductors, joints, contacts and windings of the low resistance type in oil circuit breaker assemblies, rotating electrical equipment, transformer and coils.

In manufacturing, application is mainly in controlling processes, which include, identification and classification, in terms of resistance, of metal and metal alloy components.

Complete details are in Bulletin 24-26-25.

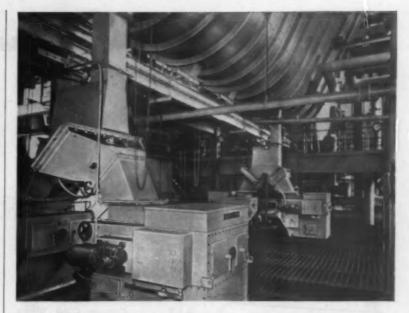
### Package Boiler for Light & Medium Duty

Available through 60 hp
B-11 or 2,070 lb/hr, the new
Monitor packaged boilers
are being produced by CleaverBrooks Company. 326 East Keefe
Ave., Milwaukee 12, Wisc. Units can
be fired with oil or gas or furnished
with a combination burner.



There is no need for a chimney. A vent removes any combustion gases from the boiler room. Unit is fully automatic in operation.

The Monitor package is completely factory assembled and tested. As to starting, Cleaver-Brooks furnishes field starting service, adjustment and and operator training at the job site at no additional cost.



# \$4,000,000

# depends on RICHARDSON COAL SCALES

On 24-hour duty at McGuire Air Base, Wrightstown, New Jersey, four Richardson H-39 Coal Scales...capable of handling up to 80 tons of coal per hour...contribute their substantial part to providing heat for 75 key buildings in a huge new heating system.

And checking on coal consumption is a simple matter. Each scale has a capacity of 200 lbs. and, during operation, the total amount of coal weighed hour after hour is registered on a direct-connected counter. Hold-ups in flow of coal to the boiler are eliminated by a simple gravity-operated by-pass mechanism in the feeder. Added protection is provided in locating all electrical equipment outside the coal chamber, insuring completely fault-free performance.

This reliance on Richardson equipment in a vital function is repeated time and again in power installations throughout the country. Send for H-39 Coal Scale Bulletin #0352A for the reasons behind this confidence.

Richardson Scales conform to U. S. Weights and Measures H-44 for your protection.



RICHARDSON SCALE COMPANY, Clifton, N. J.

Sales and Service Branches in Principal Cities. Also Manufactured in Europe to U. S. Standards

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HOT FORGED from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

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# Standard & Double Extra Heavy UNIONS

Available with screwed or socket weld ends. 3000-lb. sizes ½8" to 3"; 6000-lb. sizes ½8" to 2".



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With screwed or socket weld ends. 3000-lb. and 6000lb. service

### MALE & FEMALE UNIONS

With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.



# FULL STAINLESS & FULL ALLOY STEEL UNIONS

With screwed or socket weld ends. 3000-lb. and 8000-lb. service.



WRITE FOR CATALOG 56 shewing the complete Catawissa line of Perfect Seal Products

FITTINGS COMPANY
950 Mill St. • CATAWISSA, PA.

### New Product Briefs (Continued)



### All-Glass Valve

New Y-type all-glass valve by Corning Glass Works, Corning, New York, is virtually impervious to corrosion. The two inch Pyrex valve is resistant to virtually all acids, can withstand pressures of 50 psi. It weighs nine pounds — 1/3 to ¼ the weight of conventional valves.

All working parts exposed to fluid are of glass or Teflon. Acidic fluids of all concentrations or compositions at temperatures as high as 250 F can be handled. It is recommended for use in processing all acidic metallic salts, various crystalline slurries, and all acids except hydrofluoric and hot concentrated raw phosphoric acids.

Low thermal expansion of the glass allows a sudden temperature differential thru the valve of 200 F. The spring-loaded stem keeps the plug tight when closed and holds it in any fixed position until the hand wheel is turned. Travel depth of the plug is 2 % in.

For additional safety, the tempered glass valve body is armored with a fiber glass-polyester resin sleeve. Armor is designed to carry the same work load as the glass valve in case of failure.

### Chemical Injector Pump

B-13 Dept. 78, 320 Hughes St., Houston 11, Texas, has developed a new motor driven Texsteam Chemical Injector Pump Model SAC-4000, which accurately injects measured amounts of liquid chemicals into flow lines and pressure vessels, against pressures up to 1200 lb.

The pump is operated by a ¼ hp motor, the 50 to 1 reduction worm gear assembly operates the cross head drive mechanism to move the piston injectors. There may be one or two piston injector assemblies on each pump, each piston may inject measured amounts of a separate chemical at the same time. Output may be accurately pre-set to inject from a few ounces to 40 gallons in a 24 hour period, with one injector head, by regulating the length of the piston stroke and by the size of the pistons.



The new pumps are available with three standard size piston-injector head assemblies; the ¼ in. pumps against 1200 lb pressure, the ¾ in. pumps against 500 lb and the ¼ in. pumps larger volume against 250 lb pressure. Each piston has a separate calibrated stroke adjustment which may be locked in position.

These new Texsteam SAC-4000 Chemical Injector Pumps can be used in many ways by different industries to inject various types of thick or thin, corrosive or non-corrosive liquid chemicals, such as injecting dyes into a process steam in a textile plant, or additives to a chemical process, or feed water treating to a boiler. When fitted with a check valve the pumps can withdraw measured samples from a flow line.

### Cutting or Beveling "Out-of-Round" Pipe

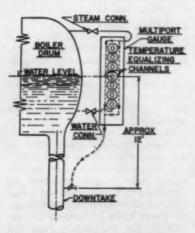
B-14 Beveling Machine Company, 311 E 3rd St., Tulsa, Oklahoma has announced a new and improved design in the "Out-of-Round" attachment for their standard pipe cutting and beveling machines. Working on the spring-tension principle, the spring and a roller rod assembly are the two main com-

ponents of the attachment. The special attachment is engineered to eliminate the problem of inaccurate cuts or bevels on "out-of-round," or imperfect pipe.



The roller rod assembly consists of a rod that is fastened to the body of the attachment by means of a set screw arrangement, and a small diameter wheel that is affixed to the end of the rod, which travels the outer circumference of the pipe surface. Through the action of the spring, constant pressure is applied to the roller rod, which forces the wheel to follow the contour of the pipe. This maintains the torch equidistant from the pipe at all times, thus correcting for any defects in the surface.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 99



### **Accurate Water Level Check**

B-15 Corporation of Lancaster,
Ohio has announced an improvement in their Multi-Port





# REQUIREMENTS IN A ROTARY PUMP?

Today perhaps your requirements are for hydraulic applications...next week for processing equipment...next month for pressure lubrication on industrial equipment. Whatever the need, Roper has the right pump for you—to do the job better!

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Roper's basic principle employing two equal size pumping gears lends itself to wide flexibility in designing custom pumps. You name the P.S.I., the G.P.M., the port arrangement required, plus other data and we'll work with you in developing rugged, dependable equipment.

### MANY STANDARD ROPERS ARE ADAPTABLE TO YOUR NEEDS

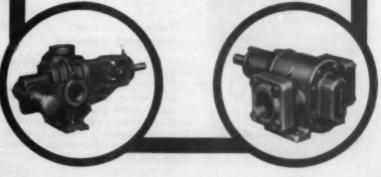
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W. T. Ellington, President Mundo Engineering Co.

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### New Product Briefs (Continued)

Bi-Color Gauge, which overcomes the error arising from relative water density.

As water drums get smaller in proportion to boiler size, water gauge accuracy increases in importance. Water gauges always have had an inherent error. Water in the gauge cools — is denser and hence heavier per unit of volume than the water in the drum. A shorter column of water in the gauge balances the head of the water in the drum. As a result, the gauge shows the water lower than it actually is.

In the new development, called the Temperature Equalizing Multi-Port Gauge Assembly, a steam jacket surrounds the ports, keeping the water in the gauge at or near the temperature and density of the water in the drum. This eliminates all or nearly all of the error. Circulation in the jacket is made independent of circulation in the gauge itself. The lower connection of the jacket is to the boiler downtake, at least 12 ft below water level.

The assembly is most effective on boilers operating above 1500 psi.



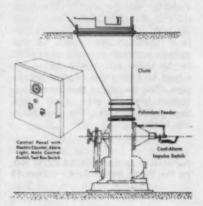
### Valve for Turbine Over-Speed Protection

B-16 Co. Wrentham, Mass. has announced in their standard reheat header spring loaded safety valve line an added feature for protection against over-speed of the low pressure turbine in case of failure of the intercept valve to close on loss of turbine load.

This feature consist of an air lift cylinder added to the conventional spring loaded valve for lifting the valve to its full discharge capacity at any pressure down to zero. The air lift cylinder will open the valve to its full capacity in less than a tenth of a second.

The air lift mechanism is controlled by an over-speed switch on the turbine which acts immediately so than over-speed due to loss of load takes place. By the opening of the reheat safety valves immediately on an increase in turbine speed, the pressure in the header is relieved so that cause of the over-speed is removed.

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### **Coal Scale Alarm**

B-17 tem developed by Richardson Scale Company. Clifton, New Jersey, provides automatic protection against coal supply failure in pulverizer or stoker-fired operations.

The alarm needs no adjustment for varying boiler loads. Dust or dirt cannot affect the operation.

A magnetic switch receives impulses from magnet mounted on pulverizer or stoker shaft and transmits electrical impulses to the counter. There is no mechanical connection. If the coal supply runs low or if coal arches and the scale cannot complete its discharge, an alarm is sounded to indicate failure of coal supply to the boiler.

Product data sheet 5703 gives de-



"Joe, you wouldn't buy the engine of your car from one manufacturer, the wheels from another and the body from still another, would you? Neither would I. And when I design for induced draft, I specify a P-D Stack because the I.D. Fan. though it is important, isn't the whole story. The combined breeching, stack and fan, built as ONE apparatus, gives me unit responsibility, compact design, simplified engineering, and positive performance, with a lot less purchasing details.

"Another thing, I'd rather buy my Dust Collector from the same manufacturer that made my Stack and Fan. For this is all part of the same, system for handling the gas after it leaves my boiler unit.

"There's nothing like putting all the responsibility on ONE manufacturer's shoulders if you can, for then you'll come out on the long end nine times out of ten. Buying such equipment piece-moal is antiquated and costly."

You can save a lot of time, trouble and money by purchasing your Stack and Dust Collector from Prat-Daniel.

Write for data.





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Exclusive self-cleaning brass liner actually "flexes" off corrosion — pre-vents scale growth and "sticking" of

 Up to Three Switches an Exclusive Safety Feature

Only MAGNETROL design can provide up to three completely separate switch mechanisims, each operating at its own level, in a STANDARD control. Use extra switch for "stand-by" pump for emergency use; or alarm BEFORE fuel cut-off; or high level alarm; etc.

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We offer STANDARD Magnetrol Boiler Water Level Controls for service at temperatures up to 750°F., at pressures up to 600 psi., for single stage or multi-level stage service with up to three separate switching actions. Special units available for more extreme requireme

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# **NEW Catalogs & Bulletins**

### STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

10—Stokers—Application & operation of A.E. Types "H" & "R" and Vibra-Grate stokers described in latest bulletins. Latter burns low grade fuels without smoke. No dust collectors necessary. — AMERICAN ENGINEERING CO.

11—Feedwater Treatment—Bulletin describes liquid and dry (Braxon & Flako) boiler feedwater treatment recommended for removal and prevention of scaling and corrosion during use of many types of water and for prevention of foaming and carryover. — ANDERSON CHEMICAL CO.

13 — Power Plant Equipment — 12 page booklet No. 1022-A gives details on combustion and boiler feedwater control, pressure reducing, desuperheating and automatic soot blowing — retractable and rotary. — COPES - VULCAN DIVISION, BLAW-KNOX COMPANY.

19—Feed Water Deoxygenation—12 page Bulletin BW-7 describes advantages of chemical deoxygenation of boiler feed water with an aqueous solution of Hydrazine. Covers in detail the properties and action of Hydrazine in maintaining boilers as well as recommended methods of application. — FAIRMOUNT CHEMICAL CO., INC.

30—Guide Specifications — 64 page brochure, including 5 drawings, is a comprehensive guide for preparing specifications on coal-fired low-pressure heating plants in the size range of 750,000 to 5,500,000 Btu/hr. All aspects affected by choice of fuels from storage bin to stack design covered fully. — BITUMI-NOUS COAL INSTITUTE.

35 — Unit Steam Boilers — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions.—CLEAVER-BROOKS CO.

48-Boiler Tubes - Booklet gives information on care of boiler

tubes, causes of chemical attack, etc. Contains charts of weights, working pressures, etc., for boiler tubes and pipe.—BOILER TUBE COMPANY OF AMERICA.

50—Coal Crushers—Catalogs 784-C describes single and double roll crushers, swing hammer pulverizers for all sizes of plants.—JEFFREY MANUFACTURING COMPANY.

### FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

101 — Heat Exchangers — Bulletin 1.1K5 describes exchangers widely used on engines, compressors and other machinery for cooling lube oil, jacket water, air and gas. Compact, standardized units in widerange of sizes. — ROSS HEAT EXCHANGER.

107—Proportioning Pumps—4 p brochure illustrates and describes company's proportioning pumps and package chemical feeding units. Includes applications and specifications.—BIRD ARCHER CO.

122—Industrial Fans—Bulletin 702 covers Type XL fans for air and material handling. Volumes to 130,-000 cfm pressures to 18" SP. Catalog 855 describes Pressure Fans. Volumes to 12,000 cfm, 10" to 50" SP. — CLARAGE FAN CO.

letins B-1300 & B-1350 cover pumps in widest range of water handling services. Single stage, horizontal split case design. Heads up to 300 ft; capacities up to 70,000 gpm.

— PEERLESS PUMP DIV.

142—Centrifugal Pumps — Full line of single stage horizontally split case centrifugal pumps described in 12 page Bulletin 721.6; capacities 200-6400 gpm; heads up to 260 ft; maximum standardization and interchangeability of parts.—GOULDS PUMPS, INC.

145—Multi-Stage Pumps — 4 page Catalog B-100 shows design and construction details, performance curves and metallurgical details of two types of pumps which are used for general water supply, boiler feeding, ice water & brine circulation, pneumatic water systems, sprinkling systems and a wide variety of clear-liquid uses. Heads range over 600 feet, capacities to 320 gpm.—C. H. WHEELER MFG. CO.

189—Air Traps — Bulletin 289 describes ball float traps for draining water from air, gas or steam lines, or for draining light liquids from gas under pressure. Physical and selection data, prices, etc. — ARMSTRONG MACHINE WORKS.

### INSTRUMENTS-METERS CONTROLS-REGULATORS

212—Automatic Temperature Control
—Data sheets describe versatile

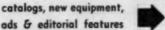
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automatic indicating temperature control offering many sequence combinations—step-heating, heating and cooling, wide limit control, or temperature control plus operation of signal devices.—SARCO COMPANY, INC.

213—Meters & Controls — Bulletin G15-1 describes and illustrates systems and instruments used in the measuring, transmitting, receiving, interpreting and controlling of 18 variables normally encountered in power plant and industrial plant operation. — BAILEY METER COMPANY.

215—Automatic Valves & Controllers—8 page catalog describes the function, application, construction and range of sizes of company's lines of pressure reducing and regulating, relief, back pressure and control valves; controllers; differential regulators; oil pumping units; governors; combination and temperature regulators.—A. W. CASH CO.

222—Pressure Regulators — Catalog
No. 77 illustrates and describes
application, operation and specifications for a complete line of reducing, back-pressure and pump-pressure regulators.—MASON-NEILAN.

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Please be sure to fill in your Firm's Name and your position on the Coupon. 253—Combustion Analyzer — 4 p
Specification E65-5 describes the
"Heat Prover" which indicates per
cent by volume oxygen and combustibles present in exhaust gases from
all types of boiler and industrial
furnaces. — BAILEY METER COMPANY.

284—Liquid Level Control — 32 p
Bulletin F-4 describes the LevelTrol for automatically maintaining
liquid level at desired point in a
heater, condenser, exchanger or other vessels. — FISHER GOVERNOR
COMPANY.

287—Color-Port Water Gage—Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly

reduced maintenance requirements.
—YARNALL-WARING COMPANY.

291—Pneumatic Loading Stations—
New line of auto-manual units
of non-seal type described in Bulletin 1031. Applicable to combustion
control, feedwater regulation, pressure-reduction systems, desuperheating stations in steam power
plants. — COPES-VULCAN DIVISION.

### PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

304—Backing Rings — Bulletin 56-2 describes rings designed for fast economical fit-up in piping, tubing, fittings and valves. Shows how rings assure uniform complete-penetration welds and ease of handling in both shop and field. Carbon steel, wrought





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iron, chrome alloys, stainless, aluminum and copper.—ROBVON BACK-ING RING COMPANY.

cover Series S buildings — Catalogs cover Series S buildings (clear span widths from 4-40 ft) featuring Steelox panel construction; and Series P buildings (clear-span widths up to 100 ft); fire resistant & weather tight; simplified design eliminates much job-site labor. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

315—Pressure Vessels — Catalog 100
discusses your plate fabrication
problems and shows how company
custom-fabricates hot water storage
heaters, tanks, air receivers, blowoff tanks, etc. Corrosion resistant linings and materials featured. Suggested specifications and other valu-

able technical data given. — J. J. FINNIGAN CO.

317—Drier Compressed Air—Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation in your air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools, etc.—NIAGARA BLOWER COMPANY.

331—Storage Bins — Bulletin illustrates and describes Super-Concrete storage bins for industry. Lists of prominent users and varieties of materials are given. Contains tables of capacities and photographs of typical installations.—NEFF & FRY.

351-Steel Grating & Treads-Bulle-

tin 2486 describes electroforged steel grating and treads, their advantages and typical successful applications.—BLAW-KNOX EQIUP-MENT DIV.

367—Industrial Track—How you can save with relaying rails outlined in Catalogs RT-9. Covers switch material and accessories. — L. B. FOSTER CO.

375—Welding Service — Sheet TIS
2600 describes new welding advisory service. Survey highlights operations where metal joining, machinery repair and overlaying for wear resistance can be increased profitably.—EUTECTIC WELDING ALLOYS CORPORATION.

392—Metal Cutters—Catalogs 718M & 755 describe three heavy duty units for cutting almost anything in metal up to %" — rods, wire, chain, etc. — H. K. PORTER, INC.

#### PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

402—Forged Sizel Valves—General Purpose Valves, Supplement No. 1 to Catalog F-9, covers gate, globe and angle valves. \( \frac{4}{n} \) thru 2" sizes, for 150-800 pound service. Featuring 13% chrome stainless steel trim with hard facings. — HENRY VOGT MA-CHINE CO.

403—Valve Operators—Folder shows how re-designed sprocket rim makes any valve readily accessible from the floor. Simplifies pipe layouts, prevents accidents, fits all valve wheels. — BABBITT STEAM SPECIALTY CO.

407—Piping Materials—Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping ad-

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jacent to welded joints. — PITTS-BURGH PIPING AND EQUIP-MENT COMPANY.

411—Steam Trap Book — 44 page Steam Trap Book contains useful data on trap sizing, calculation of condensate loads, installation and maintenance data. — ARMSTRONG MACHINE WORKS.

420—Valves — 24 page Catalog illustrates and describes bronze, iron, steel and corrosion-resistant valves for controlling the flow of water, oil, gas, steam and corrosive fluids.

— THE WM. POWELL CO.

430 — Check Valve — Catalog 30A highlights the "tilting disc" check valve for handling fluids or gases under wide range of pressures.

THE CHAPMAN VALVE MFG. CO.

432—Aluminum Jacketing — Data sheets describe low first-cost, long life jacketing for weatherproofing of insulated lines, towers, vessels and tanks. Lap-Seal design feature makes more positive weather seal. — CHILDERS MANUFAC-TURING COMPANY.

443—PVC Fittings & Flanges—Corrosion resistant polyvinyl chloride pipe fittings & flanges covered in 12 p catalog, featuring characteristics, advantages, limitations, operating pressures, temperatures, field tests, etc.—GRINNELL COMPANY, INC.

445—Heat Transfer Medium—How new solid medium can give you savings up to 75% over jacketed equipment outlined in brochure. Non-metallic plastic compound easily applied in paste form over either steam traced or thermal electric systems; wide temperature range. — THERMON MFG. CO.

487—Plastic Valves — 6 p Circular illustrates new Luncor valves and fittings. All-moulded corrosion-resistant PVC valves made to handle wide range of acids and alkalis and to resist chemical attack and deterioration. — THE LUNKEN-HEIMER CO.

letin D-92 shows how valve will minimize problems inherent in steam service. One pilot with three interchangeable springs provides range of from 2 to 150 psi.—FISHER GOVERNOR COMPANY.

#### MAINTENANCE PACKING GASKETS, LUBRICATION

500—Liquid Separator Filter—Lowflow Space-Saver Fram units, for solving separation problems in industry plants described in Bulletin WL8-57. Easy installation; no maintenance except periodic replacement of cartridges and draining of sump. —WARNER LEWIS COMPANY.

511—Maintenance Ideas—"Genius at Work" — Contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line. — KANO LABORATORIES.

512—Lubricator Vacuum Type Pumping Unit—If your plant is experiencing difficulty with visibility and excessive maintenance on lubricator sight glasses, the new 82 vacuum pumping unit will offer lower cost. Form 1263 gives principle of operation and advantages.—MANZEL.

523—Boiler Gaskets — Catalog describes wire inserted woven asbestos and spiral wound metal-asbestos — for manholes, handholes and tube caps of all makes of stationary and marine boilers, water walls, economizers, etc. — THE BELMONT PACKING & RUBBER CO.

# USE SPI READER SERVICE

531—Stack Maintenance — How wrought iron offers unique defense against flue gas corrosion described in bulletin "Wrought Iron for Flue Gas Conductors."—A. M. BYERS COMPANY.

564 — Anti-Corrosive Paints — Bulletin, "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.— SUBOX, INC.

576—Mechanical Sealing — Catalog
480, a valuable reference book
for maintenance engineers illustrates
types of Dura Seals for specific temperature, pressure and fluid conditions. — DURAMETALLIC CORPORATION.

595—Plant Lubrication — The Lubriplate Service Handbook —
Gives valuable information on the subject of lubrication in all its forms, intended to be of everyday use to plant superintendents, managers, maintenance engineers and

those in charge of plant production and maintenance. — LUBRIPLATE DIVISION, FISKE BROTHERS RE-FINING CO.

# ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

600 — Conveyor Idlers — Bulletin SI-116 describes pre-lubricated "UST" Conveyor Idlers. Incorporating Timken bearings and Garlock Klozures, construction permits operating without lubrication for 1-3 years or more. — CONTINENTAL GIN COMPANY.

604 — Motor Units — Catalog 51 describes motor units for accurate performance and longer, lower cost life for operation of valves, floorstands and sluice gates. — CHAPMAN VALVE MANUFACTURING CO.

619—Automatic Coal Scales — Bulletin O352A covers Model H-39 (capacities up to 40 tons/hr) automatic coal scales. Coal never arches in feeder or weighing hopper — dust sealed; contact platework of stainless steel. — RICHARDSON SCALE COMPANY.

623—Overhead Handling Equipment
— 8 page catalog pictures and
describes overhead handling equipment. Includes all basic standard
equipment used in 90% of all Monorail installations. — THE AMERYCAN MONORAIL CO.

648—Belt Fastening Tools — Bulletins F-110 and F-111 — Describe new Flexco power tool wrenches and power tool boring punches, designed to speed up fastening of wide conveyor belts; and give recommendations on the use of various impact tools connected therewith.—FLEXIBLE STEEL LACING CO.

### WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

703—Air Conditioning—Bulletins 112 & 122 describe "controlled humidity" method where cooling and heating functions are made completely separate from adding or taking away moisture. No moisture sensitive instruments needed in flexible & compact design.—NIAGARA BLOWER CO.

712 — Ion Exchange Equipment — Bulletin A-255 describes the various methods of ion exchange treatment which provide suitable boiler feedwater, process water, and purified solutions.—ILLINOIS WA-TER TREATMENT CO.

### **Bulletins (Cont'd)**

713—Electric Precipitators—26 page
Bulletin 104 shows how units
meet five engineering requirements
—Positive control of gas flow; high,
uniform electrode emission; Effective
continuous cycle rapping; Simple,
rugged construction; and Safe, trouble-free high voltage equipment.
Gives 9 time-tested steps to a successful installation.—BUELL ENGINEERING COMPANY.

716—Dust Collection — Whether nuisance elimination or process material recovery, check on Whirlex Dust Collector Units. Engineering data available. — THE FLY ASH ARRESTOR CORP.

738—Deaeration—Why? How?—Bulletin 4650 explains in capsule form fundamentals of deaeration and why it is so necessary in water conditioning. Principles, advantages, and application of various methods discussed.—COCHRANE CORPORATION.

768—Steam Humidifiers — 16 page Bulletin No. 500 shows necessity of humidification, lists recommended storage and processing temperatures and relative humidities, lists regain of hygroscopic materials and complete physical details of all types of Armstrong steam humidifiers. — ARMSTRONG MACHINE WORKS.

#### ELECTRICAL

811—Electric Heat—"100 Ways to Apply Electric Heat" gives a wealth of informative data on the use of electric heat in industry fast, uniform, dependable, backed by nation-wide engineering service. — EDWIN L. WIEGAND CO.

815—Induction Motors — How spiral ventilation of two-pole motors eliminates hot spots and cuts windage noise described in Bulletin O5B8123A. Fans drive air thru holes in yoke, cooling stator lamination pockets, stator coils and absorbing heat from the rotor.—ALLIS-CHALMERS.

842 — Circuit Protection — Bulletin FIS describes the maintenance free Fusetron fuses which protect motors, solenoids, coils and transformers against burnout, and which increase production by eliminating needless blows.—BUSSMANN MFG. CO. 855—Wiring Analyzer — 4 page bulletin describes Model 301 Adequate Wiring Analyzer which quickly, simply and easily tests wiring without confusing calculators or slide rules.—SPRAGUE ELECTRIC COMPANY.

J-1—Masonry Saw—8 page booklet describes and illustrates Supermatic Masonry Saw, a 2 hp masonry saw with Sta-Level Cutting Head and Hi-Lo Control Wheel, plus 30 outstanding features. — CLIPPER MFG. CO., 2800 Warwick, Kansas City 8, Mo., Suite 235.

J-2—Motor Selection — 12 page Application Guide No. 102 makes it easy to select electric motors for all popular applications. — CEN-TURY ELECTRIC CO., 1806 Pine St., St. Louis 3, Mo.

J-3—Underground Pipe Conduit — 12 page Bulletin No. 9156 covers all of the essentials pertaining to underground pipe conduit. Shows how Thermo-O-Tile is constructed and installed; moided and filler insulation; how piping is supported, anchored and guided; complete specifications. — PORTER-HAYDEN COMPANIES, 825 Frelinghuysen Ave., Newark, N. J.



J-4—Overhead Cranes — 2 pocket booklets "Rules and Regulations for Crane Operators" and "Crane Trouble Shooter" give short, direct information for everyday use on company's line of Overhead Traveling Cranes.—P&H HARNISCHFE-GER, 4400 W. National Ave., Milwaukee 46, Wis.

J-5—Machinery Mounts — Bulletin No. 546 illustrates and describes company's line of leveling and spring mounts. Includes selection data. — BARRY CONTROLS INC., Box 215, Watertown 72, Mass.

J-S—Protective Equipment — 32
page catalog shows how Charco
high voltage protective equipment is
carefully manufactured and tested.
Describes and illustrates many products and gives clear, concise instructions as to proper care and use of
high voltage rubber protective equipment. — CHARLESTON RUBBER
CO., Stark Industrial Park, Charleston, S. C.

#### USE SPI READER SERVICE

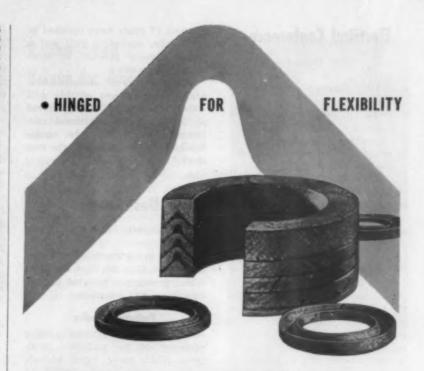
See Pages 99-100

J-7—Color-Coded Gaskets & Shims
—4 page folder describes ColorPlast, a plastic material used in a
system in which each gauge of a
gasket, shim, spacer, or washer is
made in its own distinctive color,
making possible instant selection of
the correct gauge. Dimensionally
stable, tear-resistant and self-sealing.
— GENERAL GASKET INC., Industrial Road, Clifton, N. J.

J-8—Metal Removal—4 page Bulletin No. 6-1 features numerous new applications for the Arcair Torch for the cutting, gouging, beveling or grooving of all metals. Includes data on Arcair electrodes.—ARCAIR COMPANY, 419 S. Mt. Pleasant St., Lancaster, Ohio.

J-9—Controller — Reprint 66 discusses a signalling system which provides an alarm and record of the malfunctioning of any component in demineralizing equipment which is intended to operate in accordance with a predetermined program. Entitled, "A New Concept of Fully Automatic Demineralizer Operation." — INFILCO INC., Box 5033, Tucson, Arizona.

J-10—Floor Surfacing — Illustrated Booklet, "Monorock," describes heavy-concrete floor surface for industrial, commercial and institutional use. This monolithic concrete surface is harder and tougher than conventional concrete floors.—KAL-MAN FLOOR CO., 110 East 42nd St., New York 17, N. Y.



# BELL-SHAPED V-Design makes BEL-VEE PACKING pressure sealing

ask your BELMONT Distributor

Such leading Packing Distributors as:

Warren & Bailey in Los Angeles and

Speck-Marshall in Pittsburg

are ready to supply your emergency as well as regular requirements.

Scientifically designed to make the pressure seal itself, Bel-Vee Rings expand toward the rod and stuffing box wall, with increased pressure, to automatically form the seal. Then when pressure is relaxed, Bel-Vee Rings contract from the rod for free movement with minimum friction.

That is why Bel-Vee Ring Packing keeps equipment running smoothly—cuts maintenance—lasts longer.

Offered in sets for pressures to 6000 psi for sealing reciprocating rods of pumps, engines, compressors, hydraulic equipment and valve stems.

Bel-Vee Rings are individually molded in practically every rod and stuffing box size, and in a number of basic material combinations for use against water, oil, solvents, steam, air and gas. Catalog No. 56. Also available in du Pont Tefion for all-chemical service. Catalog T-57.

The Belment Packing and Rubber Company Butler & Sepviva Streets, Phila. 37, Pa.

BELMONT

#### **Electrical Conference**

(Starts Page 40)

- Overall economy in textile mill operation.
- Flexibility for possible plant changes.
- 6. Capacity for load growth.
- Provision for future plant expansion.
- 8. Good voltage regulation.
- 9. Good lighting.

GEORGE V. FOWLER of Henderson Cotton Mills, showing that modernization is a continuing process, discussed progress in modernizing a cotton mill from 1940 to the present time.

"The level of light intensity in the weave room was improved from 8 foot-candles to 35 footcandles, line shaft drives have all been replaced by modern individual motor drives, and machinery in all departments has been replaced with modern units boasting the latest refinements.

"The changes effected during

the past 17 years have resulted in a smoother operating mill and a higher quality product to meet market demands.

"Expansion and modernization are still in process at this mill which is currently adding 20,000 sq ft for twenty additional new spinning frames and the equipment necessary to supply the raw stock."

#### **Dust Control**

(Starts Page 42)

the kilns every twenty-four hours and more than 90% of the dust which previously polluted the atmosphere was eliminated.

#### **Pollution Codes**

More and more interest is being centered on air pollution problems. With more rigid anti-air pollution laws being enacted by nearly all Southern states and many local municipalities, the control of industrial dusts is a problem of increasing importance to plant management and operating engineers. In some instances successful installations can eliminate an atmospheric pollution problem and at the same time recover valuable process materials.

The Southern Lightweight wet dust collector is applicable to many other problems besides in the lightweight aggregate industry. A few of these are dusts from fertilizer plants, incinerators, clay processing plants, rock products manufacturing, asphalt plants, coal burning operations, chemical plants and metal smelting. Some of these installations will be reported during the coming months in SPI.

#### **Plant Lighting**

(Starts Page 78)

factor. In one plant where the working areas of the machines were painted a light buff, it was found that the mechanics were so convinced of its benefits that they kept the light area clean without supervision.

#### Study Required

Where a lighting system employs mercury lamps, care must be used in the selection of colors since the light from these lamps is largely blue-green with very little red. Thus some colors will be distorted. Green and blue paint will fare quite well but the warmer colors, red and buff, will not appear in their true color value. Where color-improved mercury lamps are used, the warm colors will have a better appearance.

In workrooms where color matching or fine color discrimination is necessary, color should be eliminated. The ceiling should be painted a flat white and the walls either flat white or light gray. The light reflected from colored walls and ceilings may alter the appearance of the materials to be matched or evaluated.

#### Repainting Indicated

Usually, when the collection of dirt and depreciation of paint are sufficient to markedly mar the

# WHEREVER YOU NEED TO COOL A FLUID... and have a problem of water supply or disposal...use NIAGARA "AERO"

Evaporating a very small amount of water in an air stream you can cool liquids, gases or vapors with atmospheric air, removing heat at the rate of input, controlling temperature precisely. Save 95% of the cost of cooling water; save piping, pumping and power. You quickly recover your equipment cost.

**HEAT EXCHANGER** 

You can cool and hold accurately the temperature of all fluids, condense



vapors, cool water, oils, solutions, intermediates, coolants for mechanical, electrical or thermal processes. You have a closed system free from dirt. You have solved all problems of water availability, quality or disposal, maintenance expense is low.

You may apply this to solvent recovery, vacuum systems controlling reactions, condensing distillates, cooling reflux products.

For more information, write for Bulletins 120, 124, 135. Address Dept. SP-2.

#### NIAGARA BLOWER COMPANY

Dept. SP-2, 405 Lexington Ave., New York 17, N. Y. Niagara District Engineers in Principal Cities of U. S. and Canada

appearance of the room, we consider repainting. Unfortunately, by this time the illumination in the room has depreciated more than has the appearance of the room. But the cost of lamps and current to operate the lighting system is still the same. Obviously, the cost of the illumination has gone up—and if we calculated it, the figures would be alarming. Repainting should threefore be dictated by drop in illumination, not solely by appearance of the room.

The industrial executive can calculate the period between repainting in his own plant. The cost of the current to operate the system per hour divided by the foot-candles obtained will give the cost per foot-candle per hour. If the cost of repainting the room is determined, the time for repainting is indicated when the cost per hour of the foot-candles lost through depreciation, equals the cost of repainting.

For example, if a factory 10,000 sq ft is illuminated with 50 footcandles, the cost of the current to operate the lighting system is about \$.20 per hour. The cost per foot-candle per hour will be \$.004.

The walls and ceiling of the plant are approximately 15,000 sq ft or 150 squares. If the cost of painting one square with one heavy coat of paint is \$2.25, the cost of repainting would be \$337.50.

If the walls and ceilings have depreciated the illumination from 50 to 25 foot-candles, the cost of lost foot-candles would be \$.10 per hour (25 Ftc. x \$.004). If the plant is operated 10 hours per day, 300 days a year, the management will be paying \$300.00 per year for light that is not received. Therefore, slightly over one year's operation would pay for painting the entire plant to restore illumination to its original value.

Paint and illumination indeed go hand in hand. The worker can't do his best with dull tools or inferior machines. Neither can he do his best when his speed and accuracy of vision is dulled by illumination which is paid for but never reaches his work because darkened walls and ceilings absorb a good percentage of the light.

#### Rubber-Lined Valves for Acid

A SOUTHERN container manufacturer used conventional allmetal valves on 17 deg. Baume hydrochloric acid service. (The acid is used to clean evaporators and surface condensers.) The company found it had to replace the allmetal valves regularly. Then Crane rubber - lined diaphragm valves were tried on these 4° acid lines. The manufacturer reports that the valves have not failed to function once in seven years, and are still holding tight, giving maintenance-free performance.

Rubber-lined diaphragm valve on 17 deg. Baume hydrochloric acid service in a southern container plant.



# REDUCE OPERATING COST of VACUUM SYSTEMS with this "AERO" (air-cooled) VAPOR CONDENSER

With free air the cooling medium, you use the least water, evaporated in the air stream. You save the cost and pumping of large volumes of condensing water.

Air-vapor subcooling reduces mixture evacuated from the system, saving in the operation of steam ejector or vacuum pump.

This air-cooled condenser gives you more capacity than other types at a substantial saving of steam and power. Water supply, scaling treatment and disposal problems are eliminated.

You get pure condensate, an improved product; often profit by recovery of residues now wasted. There can be no contamination of your product at any time; it never touches raw water. Condensing, of water, of solvents or of your product, is simplified; you have one, compact, easily maintained unit replacing both cooling tower and barometric or surface type condenser.



Niagara Aere Vaper Candenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation.

Maintenance expense is low. Niagara Aero Vapor Condenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation. Summer-winter dampers and Balanced Wet Bulb Control provide precise, year 'round adjustment of capacity to load.

Constant temperature, uniform products and maximum production 12 months a year are assured. Capacities up to 13 million BTU/hr.

Write for full information. Ask for Bulletin 129R

#### **NIAGARA BLOWER COMPANY**

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# **CHROMALOX**

electric cartridge heaters



#### POSITIVE LEAD WIRE PROTECTION FOR STANDARD AND HI-WATTAGE MODELS

New special features help Chromalox electric Cartridge Heaters provide longer life and more dependable spot heat. Use where abrasion or steam, oils or moisture limit heater life.

New high strength spring guard protects against stress and vibration. Moisture-resistant flexible brass conduit provides rugged, vaportight, drip-proof cover for lead wires.

Get the full story today. Write for Cartridge Heater Bulletin 850.



Edwin L. Wiegand Company 7563 Thomas Boulevard • Pittsburgh 8, Pa.



#### Southern News Briefs (Continued)

(Starts Page 8)

have been put into full production by the Stephens-Adamson Mfg. Co. at Clarksdale, Mississippi. The company engineers conveying systems and builds a broad line of bulk materials handling equipment.

The Clarksdale division will fill an important role in supplying Stephens-Adamson's southern market, as well as supplementing distribution of products in other areas.

Management of the new division will be headed by D. R. Dolan. Mr. Dolan joined the Stephens-Adamson organization in 1951, and served as regional branch office manager of the Raleigh, N. C. regional branch office for three years.

Completely modern, the new plant fabricates component parts for conveyor systems which are also produced at the S-A Aurora, Illinois manufacturing division.

The Clarksdale operation is expected to materially increase production of carriers. Carriers are the rollers over which conveyor belts transport bulk materials.

Florida — Recently with the sales office in Birmingham, Robert R. Williams is now a sales engineer with The Trane Company's Pensacola office. Trane manufactures air conditioning, heating and ventilating equipment.

Alabama — R. S. Mills is now Sales Manager of the Underground Fittings Division of Anderson Electric Corporation in Birmingham.

Louisiana — Assistant District Sales Manager for the past year, Thomas M. Hogan has been appointed New Orleans District Sales Manager for Jones & Laughlin Steel Corporation. The New Orleans Office is located in the Delta Building.

Georgia — With headquarters at 33 Candler Bldg., Atlanta 3, Georgia, Lowrie C. Barton has been appointed Georgia representative of Central Transformer Corp., Pine Bluff, Arkansas. Mr. Barton is also Southeastern representative of Newman Electric Motors, Inc.

Florida - Robert S. Belcher, 1516

S. Lois Avenue, Tampa, Florida is now a sales representative of Trion electronic air cleaning equipment.

Texas — Dresser Industries, Inc., Dallas has announced several executive promotions — R. E. Reimer is executive vice president; John Lawrence an executive vice president; and Thomas L. Moody, vice president in charge of industrial relations.

#### Anderson Electric - Ala.

Edward V. Diercks of New York has moved to Anderson Electric Corporation in Birmingham. Alabama, as assistant to the general sales manager of the corporation, it is announced by Vice President C. E. Bitzer.

In addition to his work in sales, Mr. Diercks will manage the Advertising and Public Relations Departments.

#### J. J. Finnigan - Memphis

W. J. McAlpin, President of J. J. Finnigan Co., Inc., has announced the recent opening of a new sales office in Memphis, Tennessee. William M. Hunt is the sales representative in Memphis, and his office is located at 5390 Laurie Lane.



William M. Hunt

The J. J. Finnigan Co., with headquarters in Atlanta, Georgia, is one of the South's leading fabricators of tanks, smokestacks, piping, breeching, plate work, water heaters, boilers, etc. Branch offices are also maintained in Washington, Charlotte, Houston, Dallas, Jacksonville, Little Rock, New Orleans, Miami, and New York City.

#### Otis - New Orleans

The appointment of F. W. Peterson as District Manager of the Otis Elevator Company's New Orleans District, has been announced by Emmett W. Hines, Vice President of the Company.



Mr. Peterson comes to New Orleans from Dallas, Texas where he was in charge of maintenance and modernization sales promotion for the century-old elevator and escalator manufacturer.

Starting his career with Otis in 1925, Mr. Peterson has held a variety of positions in the Service Division of the Company. Since 1944, he has served in a supervisory capacity in Cleveland, Ohio and San Antonio, Texas, as well as in Dallas.

#### Gen. Sls. Mgr. for Ehrsam

R. K. Yancey has been named general sales manager of The J. B. Ehrsam & Sons Mfg. Co., Enterprise, Kansas. Yancey started in the drafting department of this Kansas firm in 1945. After six years, and being promoted to chief draftsman, he transferred to the sales department and was made district manager in their Fort Worth office. In 1955 he was appointed general manager of Ehrsam Pacific, Inc., (a subsidiary company) Riverside, California.

During his 12 years with the Ehrsam firm, Yancey has had wide experience in their complete line of equipment. The company, with sales offices in Atlanta, Georgia; Denver, Colorado; and Kansas City, Kansas; manufactures passenger elevators and manlifts; complete grain elevators and feed mills; complete plaster and wallboard manufacturing plants; power transmission equipment; fertilizer manufacturing machinery — and are custom founders with Micrometal Process Iron.

#### South Central Agent for Western Precipitation

Westernn Precipitation Corporation, well-known leader in air pollution control, has announced the appointment of Process and Power, Inc., as sales agent for its Multiclone Centrifugal Collectors and Dualaire Jet-Cleaned Filters.

Process and Power, Inc., headquartered in Memphis, will cover western Tennessee, northern Mississippi and the entire State of Arkansas. The Power and Process organization, operating formerly as a division of the C. J. Gaskell Company, has been active in the Tennessee-Arkansas-Mississippi areas for over a quarter of a century and is widely-experienced in the industrial operations of this area. It has recently established new and larger office and warehouse facilities at 1565 Harbor Avenue, Memphis 6, Tennessee.



A completely piped, wired and tested factory assembly consisting of the famous WEBSTER KINETIC Gas Burner, manual firing valve, automatic diaphragm gas valve and an electronic combustion safeguard system incorporating the RA680 cabinet.

Available in three sizes with eight capacities from 800,000 to 3,260,000 Btu/hr.

\* Trade Mark

Write for illustrated Bulletin # B8/30

#### WEBSTER ENGINEERING

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Company

Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio



he characteristics of the material.

machinery, nor are we affiliated uo 2 5 CON

strong bin is only part of the storage problem.

do not sell

While

method of discharge

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Elm Street, Camden, Ohia

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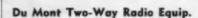
loading and unloading systems. manufacturers, we



#### Atlanta Plant for Federal Pacific

In late April Federal Pacific Electric Company's new regional manufacturing plant at 5745 Peachtree Industrial Boulevard in Atlanta, Georgia will be fabricating panelboards, switchboards, motor control centers, and special enclosures for industrial and electric utility customers in the Carolinas, Georgia, Florida, Tennessee, Virginia, Mississippi, Louisiana and Alabama. A similar manufacturing facility in Dallas serves the Southwest.

Manager of the new facility, in charge of all plant operations, will be S. T. Stendera, a graduate of Georgia Tech with 20 years experience in the electrical field. W. L. Sullivan will be regional sales manager and D. P. Lacock will manage apparatus sales to



The appointment of Rondal L. Miller as southern regional sales manager of two-way radio communications equipment for Allen B. Du Mont Laboratories, Inc. has been announced.

Mr. Miller, who came to Du Mont after serving as zone manager for four years in the Kentucky and Tennessee areas for Motorola Communications and Electronics, Inc., will be responsible for management of field sales and distribution of Du Mont two-way radio equipment in Texas, Oklahoma, New Mexico, Arkansas, Florida, Georgia, Ala-bama, Mississippi, Louisiana and Tennessee, His operation will be directed from southern regional offices at 3783 Van Ness Lane, Dallas, Texas.

#### Western Precipitation

Western Precipitation Corporation. long-established in the fields of electrical, centrifugal, and filter types of gas cleaning equipment, has announced the appointment of Edward R. Lawlor as Product Sales Manager for world-wide sales of Multiclone Dust Collectors.

#### Roper Hydraulics - III.

Roper Hydraulics, Inc., a new Illinois corporation, has taken over the pump business of Geo. D. Roper Corporation, Pump Division.

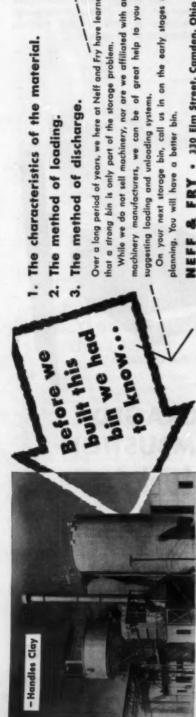
This change is in keeping with a program started in 1949, separating the pump operations from the household appliance activities of the corporation. The purpose of this change was to develop exclusive management, provide improved products, and more efficient sales engineering service for industrial nump users.

The new corporation will utilize the same plant and facilities as the Roper Pump Division.

The same personnel will continue to develop the program of research and development to manufacture quality pumps with sales and service for a wide range of industrial applications.

The officers of Roper Hydraulics, Inc. are John H. Makemson, President; Fred Dickerson, Vice President; and Charles Oehler, Secretary-Treasurer.

Other executives of the corporation include J. M. Hoskinson, Sales Manager; John Albright, Chief Engineer; and Richard Corrigan, Advertising Manager.



#### Link-Belt - La.

Link-Belt Company has opened a new district sales office in a new office building at 2025 Canal Street, New Orleans 16, with Warren K. Guy as district manager. The office will bring to 40 the network of the company's district sales offices in key cities from coast to coast.



Warren K. Guy

R. J. Tricon Company, Link-Belt industrial distributor in the New Orleans area for many years, will continue to maintain large stocks of Link-Belt products to serve industry in the area.

The announcement was made by

Allen Craig, general manager of the company's Southwest Division. The territory of new Link-Belt district and of the Tricon Company includes all of southern Louisiana from Beauregard Parish east and south and all of southern Mississippi from Vicksburg east and south.

#### Safety Award for Celotex — Miss,

The world's largest insulating fiberboard plant is also its safest.

That fact was recognized recently as the National Safety Council presented an award of honor to The Celotex Corporation "for the best (safety) record in the building board industry — 2,015,533 injury-free man-hours, Sept. 10, 1956-Feb. 15, 1957." The record was established at the Marrero, La., plant.

The award was made to Choate W. Johns, treasurer of the Corporation, by Roy G. Benson, secretary of the Council's Industrial Section, at a meeting of the National Safety Congress in Chicago. Also present was C. Eddie Hoctel, Jr., director of safety for the Marrero plant.

Hoctel stated that the competitive award was based on the long injury-free record and also on the fact that the Marrero plant accident frequency was only 1.36 persons injured per million man-hours of work, approximately one-seventh of the industry average. (An injury is considered lost-time if it is serious enough to cause an employee to lose one or more days of work.)

Celotex has some 2,100 employees in its Marrero plant, making it one of the largest employers in the New Orleans area.

#### Carrier — Houston

District headquarters for the Machinery and Systems Division of Carrier Corporation will move into a new, air conditioned office building to be constructed in Houston, Texas, it was announced by Oscar H. Mehl, southwest regional manager.

The modern, single-level structure will be erected at 2727 Weslayan at West Alabama, approximately four miles from downtown Houston. It is expected to be ready for occupancy late this year.



#### Let us solve your pumping problems

The Blackmer organization is ready to review your applications and make rotary pump recommendations that will save time and money. Blackmer offers the "know how" of over 50 years of experience in the design, manufacture and application of rotary pumping equipment. Why not add this specialized experience to your own, for the best answer to your liquid materials handling problem.



BLATIMER "liquid materials handling"® equipment

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#### FIRST 8-INCH METAL CUTTING SAW TO MEET TODAY'S NEEDS



KALAMAZOO

Ralamazoo Matel Cutting Band Saw Machines;

KALAMATIC BAR FEED

MODEL 1220 cuts 12" round, 20" fiet.

MODEL 610 cuts 6"

MODEL 8C

cuts 8" round, 16" flat, 8" pipe

Instant-acting vise holds work-piece. Four speeds for best cutting. Accuracy easily controlled—blade action in cut easy to see. Blades changed in seconds. Automatic shut-off. All parts readily accessible. Ask your Kalamazoo dealer to demonstrate Model 8C.

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Kalamazoo TANK and SILO CO.

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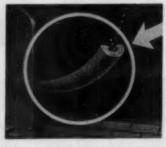
1279 E. Sedgley Ave., Philadelphia 34, Pa

Southwestern Division 2512 So. Blvd., Houston 6, Tex.

#### YOUR LUCK MAY RUN OUT

If the girth seam of your riveted HRT boiler has never buckled and leaked, you are fortunate. From the very nature of the case, your luck is likely to run out.

No one can predict when the seam will open up unless it is insulated with a National Seam Protector. The way to prevent is to protect.



We'll be glad to give you complete information by mail. No salesman will call.

National Boiler Protector Co. 938 Reibold Bldg., Dayton 2, Ohio

#### Southern News Briefs (Continued)

#### Lincoln Electric-Southeast

Recent changes in The Lincoln Electric Company's district offices have Bruce N. Frye transferring to Columbus, Ohio, and Edwin Williams transferring to Birmingham, Alabama.

Mr. Frye transferred to Columbus from Atlanta, Georgia, where he had been for 31/2 years. Before this, he worked in Lincoln district offices at Kansas City, Missouri, and Memphis, Tennessee.

Mr. Williams, a native of Louisiana, taught basic and advanced courses in manual arc welding at the Lincoln Welding School for 7 years. Transferring to sales, Mr. Williams was in Atlanta, Georgia, district office for 3 years prior to moving to Birmingham.

#### Commercial Solvents - Atlanta

Commercial Solvents Corporation has announced the opening of a new corporate district office with headquarters at 344 Williams Street, N.W., Atlanta, Georgia.

T. Austin Young has been appointed District Manager of the new office. Mr. Young joined CSC in 1941 and in 1947 was assigned to the Automotive Chemicals Department as a sales representative.

The new center will serve Alabama, Florida, Georgia, South Carolina and North Carolina. Sales representatives operating out of the Atlanta office are: for agricultural chemicals, Clifford J. Watts, Robert Thompson, Albert W. Kinnard and Harold Lloyd: for animal nutrition products, Ralph O. Cox; for automotive chemicals, Daniel S. Braden and Franklin E. Brooks: for industrial chemicals, Walter Rushin.

#### Flori-Houston Pipe & Steel Offer Expanded Services

Offering extra service on the spot for any type of piping fabrication service, The Flori Pipe Company and Houston Pipe and Steel, Inc., have appointed several district sales managers. Flori-Houston's Southern & Southwestern setup is as follows:

Houston headquarters - J. B. Spurlock will serve New Mexico, Texas, Louisiana, South Carolina, Mississippi, southern Arkansas, Alabama, Georgia and Florida.

Tulsa headquarters - Kenneth E. Martin will serve Kansas, Oklahoma, and northern Texas.

St. Louis headquarters - Herman C. Heink will serve Virginia, West Virginia, North Carolina, Kentucky, Tennessee, Missouri and northern

The Flori Pipe Company and Houston Pipe and Steel, Inc., are subsidiaries of the Sparton Corpora-

#### Jacksonville Office for George L. Simonds Company

The George L. Simonds Company. marine and industrial agent for Leslie Co. pressure, temperature and liquid level regulators and controllers in the State of Florida, has opened its branch office and warehouse in Jacksonville.

Robert Bruce has been appointed District Manager for Jacksonville. Mr. Bruce has had wide experience in the design, development and installation of blowers, burners and controls for high-pressure boilers, and, before joining the Simonds Company, was associated with Blaw-Knox Co. and Wicks Boiler Com-

#### **BFG Chemical** — Kentucky

The appointment of Charles L. Woods, Jr. as plant engineer for the Louisville, Kentucky plant of B. F. Goodrich Chemical Company has been announced by John L. Nelson, plant manager.

Formerly supervising engineer at the Louisville plant, Woods succeeds Russell C. Grover, recently named as plant engineer at the chemical firm's new Henry, Illinois plant now under construction.

Woods joined BFG Chemical Company as a technical man at the Louisville plant in May, 1946. He became a senior chemical engineer in January, 1952 and general foreman of the Geon polyvinyl chloride facility in June, 1954. Woods assumed the duties of supervising engineer in February of this year.



18,000 industrial users depend upon this amazing new chemical tool when some frozen parts tie up valuable machinery or threaten production. They say . . .

"Kroil will loosen almost anything from an embalmer's needle to a buildozer.

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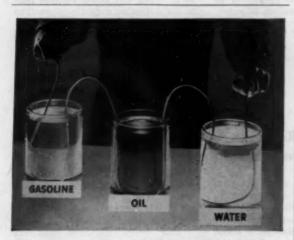
'On a 25-year-old Bessemer gas engine, two bolts twisted off before . . . after using Kroil, they all came out easily.

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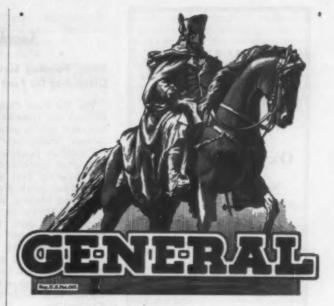
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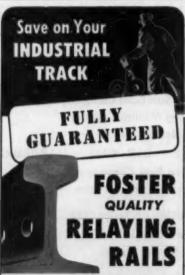
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#### Southern News Briefs (Continued)

Mtnc. Painting Service Offered by Du Pont Co.

The Du Pont Company's finishes division has recently set up a new technical service sales section to be devoted exclusively to industrial maintenance painting. The new unit will offer specialized assistance in the industrial field, as well as with contracting painters doing industrial work and national accounts.

To be known as the "industrial maintenance sales section of the trade sales division" with headquarters in Wilmington, Delaware, the new service group will offer assistance anywhere in the country. Four district managers will be located in Philadelphia, Atlanta, Chicago, and Kansas City.

Frank Smith, formerly regional industrial manager in Kansas City has been appointed to head the new section. Mr. Smith has been with Du Pont finishes division for 29 years in laboratory and field assignments.

Jack Graham, with Du Pont since 1945, will be district manager in Philadelphia; Herb Norton with Du Pont for 18 years is appointed to Atlanta; with Leo Hoellen. 22 years, going to Kansas City.

Mr. Smith's staff also includes Jack Rode, product manager, and Bob Bradley, maintenance specialist. Dixie Bearings Now Handle Parker O-Rings

Parker-Hannifin Corporation has announced the franchisement of Dixie Bearings, Inc., 276 Memorial Drive, S. W., Atlanta, Georgia as distributors of Parker synthetic rubber o-rings for sealing applications. They will be stocked in all branch warehouses located in Baton Rouge, Charlotte, Chattanooga, Greensboro, Greenville, Jacksonville, Kingsport, Knoxville, Louisville, Nashville, and New Orleans.

E. F. Brown is Dixie Vice President in charge of sales. L. C. Ely is District Manager in Atlanta for the Rubber Products Division of Parker-Hannifin Corp.

#### L. B. Foster - Houston

Ron Stanley has joined the Houston office of L. B. Foster Company, national supplier of pipe and construction materials. He will specialize in the sale of Foster's steel water well casing and pump column pipe to the irrigation industry in western Texas, Arizona, New Mexico, Oklahoma and Kansas. Mr. Stanley will maintain an office in Seminole, Texas, Post Office Box 1446.

#### Coal Research Center in Pittsburgh to Consolidate Research Activities

The bituminous coal industry, major coal users, and companies which supply materials and equipment to the coal industry have joined in an effort to establish a major coal research center in Pittsburgh to be operated by the bituminous coal industry. Bituminous Coal Research, Inc., headed by Dr. A. A. Potter, will have the responsibility for operating the new facility.

Establishment of the center will consolidate the coal industry's cooperative research activities now conducted in Columbus, Ohio, Washington, D. C., and Pittsburgh, Pa. Program at the new center will include basic research to fill in large gaps in the knowledge of the origin, physical structure and properties,

and chemical behavior of coal. Activities will emphasize the development of improved coal utilization methods and equipment.

This broad objective will encompass preparation, transportation, handling, and storage of coal; its use as electric utility fuel; and more efficient utilization in the production of industrial steam and for space heating. Investigations will be carried out on subjects related to coke production and the use of coal by the iron and steel and non-ferrous metal producing industries. Research will be conducted also in the fields of gasification, chemical and other process uses of coal.

The new bituminous coal research center will be completed in 1959.

#### **Book Reviews**

#### Applied Strength of Materials

By Alfred Jensen, M.S. in C.E., Prof. of Architectural Engineering, University of Washington, Seattle; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.; 337 pages; Price, \$5.75.

Book is designed to acquaint the reader with the strength and other properties of various engineering materials and to teach him how to design various types of structural members and connections commonly found in machines and buildings. Developments of all design formulas have been accomplished without the use of calculus, relying on thorough explanations of existing physical relationships and of the easily understood relationships of cause and effect, action and reaction.

#### Mechanical Engineering Laboratory

By Jesse Seymour Doolittle, Prof. of Mechanical Engineering, North

Carolina State College; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.; 389 pages; Price, \$6.50.

The first of its kind, separating laboratory work on instrumentation and laboratory work for engineering tests and stressing the necessity for different types of reports on these two different types of work. It purposes to acquaint the beginner with the various types of instruments available for making measurements of those quantities which are so frequently encountered in the mechanical engineering field. The use and limitations of these instruments are stressed, as well as the care required in installing them to obtain correct measurements.

### Introduction to Electrical Applied Physics

By N. F. Astbury, Prof. of Physics, University of Khartoum; Published by Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y.; 234 pages; Price, \$10.00.

This book is basically an essay concerning a new subject which has

grown up in electrical science, a subject which is neither physics nor engineering in the ordinary sense. It is an attempt to bring together the classical basis of the subject and the elements of some specialist topics which, by the natural processes of technological evolution, are finding their way into all fields of applied science.

#### **Nuclear Engineering**

Edited by Charles F. Bonilla. Prof. of Chemical Engineering; Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.; 841 pages; Price, \$12.50.

Written by twelve experts in various fields of engineering and science, this reference work gives the basic principles of the main engineering disciplines involved in the design of nuclear reactor cores and power plants. Fundamentals given briefly and clearly, with enough illustrations and advanced specific analyses so that the book is valuable to the working design engineer as well as the student.

# Coming in May...

The 12th annual Southern Plant MAINTENANCE ISSUE will feature "Plant-Tested" procedures, including equipment modernization and replacement, to reduce maintenance costs, prevent waste and improve operations. Feature articles will be written exclusively for S.P.1. by engineers and executives in Southern and Southwestern industrial and power plants, explaining problems they have had with equipment maintenance and the methods they have used to overcome these problems. This material will be "practical help" for the man in the plant.

Among the leading articles will be specific deta on maintenance of:

Piping and Valves Buildings and Equipment Materials Handling Equipment

Electrical Equipment Mechanical Equipment Production Machinery Refrigeration, Air Conditioning
Power Transmission
Water Treatment Systems
Steam Equipment
Internal Combustion Engines
Pumps and Compressors

The editorial pages will also include a special section on new equipment and supplies, listings of new tools and repair products.

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#### **FUTURE EVENTS of Engineering Interest**

- March 3-6: Third Annual ASME Gas Turbine Conference & Exposition, Shoreham Hotel, Washington, D. C.
- March 13-14; American Institute of Electrical Engineers, Textile Conference, Georgia Institute of Technology, Atlanta, Ga.
- March 17-19; American Power Conference, Chicago, Ill. R. A. Budenholzer, Director, Am. Power Conf.. Illinois Institute of Technology, Chicago 16, Ill.
- March 17-21; 4th Nuclear Engineering & Science Conference & Exposition, Chicago, Ill. For information write Atomic Exposition, 117 South 17th St., Philadelphia 3, Pa.
- March 27-28; Oklahoma Utilities Association, Annual Convention, Biltmore Hotel, Oklahoma City, Okla.

- March 27-29: American Institute of Electrical Engineers, Pulp & Paper Conference, North Carolina State College, Raleigh, N. C.
- March 31-April 2; American Institute of Electrical Engineers, Southwest District Meeting, Tulsa, Okla,
- April 9-11; Fifth Annual Conference on Accident Prevention Engineering, University of Florida, Gainesville, Fla.
- April 16-18; Natural Gasoline Assoc. of America, Annual Convention, Baker and Adolphus Hotels, Dallas, Texas.
- May 1 8: 26th Annual Meeting. American Society of Tool Engineers. Philadelphia Convention Center, Philadelphia, Pa. Richard Gebers, Public Relations Mgr., ASTE, 10700 Puritan, Detroit 38, Michigan.

- May 12-16: Southwestern Metal Exposition State Fair Park, Dallas, Texas. W. H. Eisenman, Mgr. Dir., 7301 Euclid Ave., Cleveland 3,
- May 13-15; American Institute of Electrical Engineers. East Central District Meeting, Huntington,
- Aug. 7-9: North Carolina Hospital Engineers Association, Inc., Annual Convention, Sir Walter Hotel, Raleigh, N. C. Henry W. Miller, Pres., NCHEA, Oteen, N. C.
- Sept. 15-17; American Institute of Electrical Engineers, Petroleum Industry Conference, Baker Hotel, Dallas, Tex.

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Classified rates are net, payable in advance, each month. Rates are based on column inch, with three columns per page, 10 inches per column, column width 21/4 inches - a total of 80 column inches per page.

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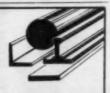
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